Smithsonian

March 1989

Stepping out again, ballroom dancers are re-creating the days of swing and sway (p. 84), as on this 1922 cover of *Smart Set* magazine

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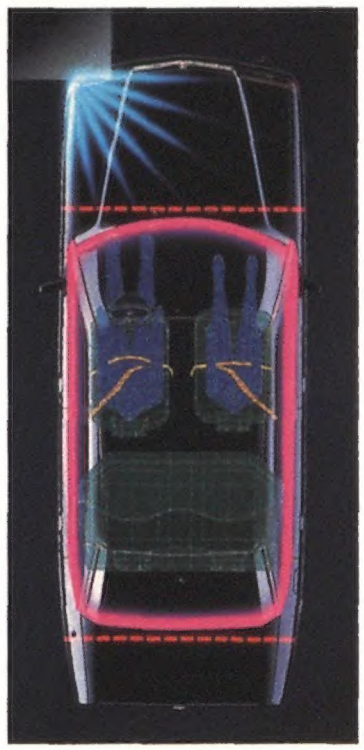

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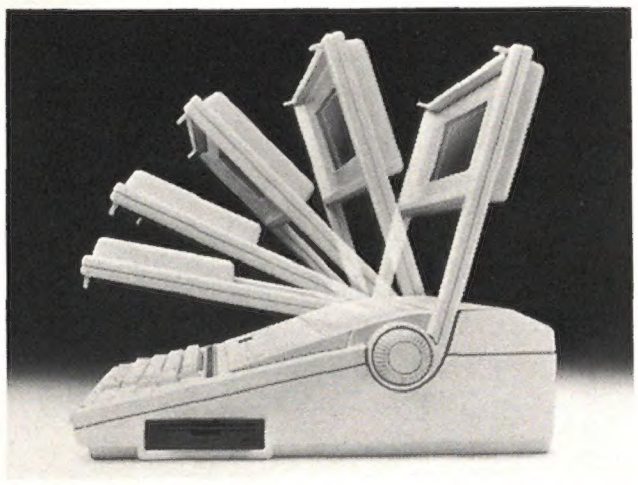

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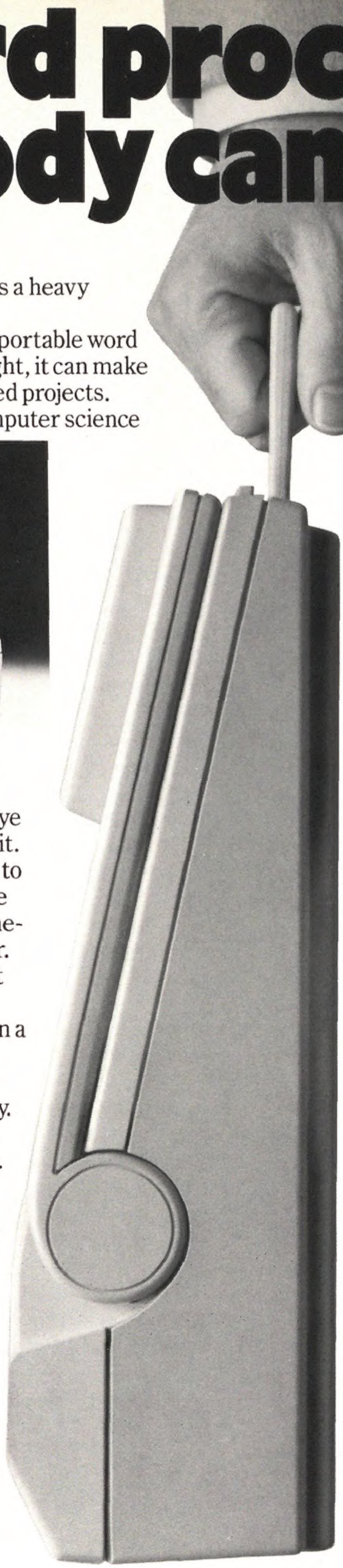

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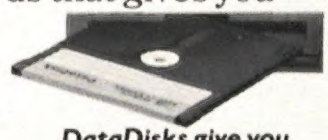

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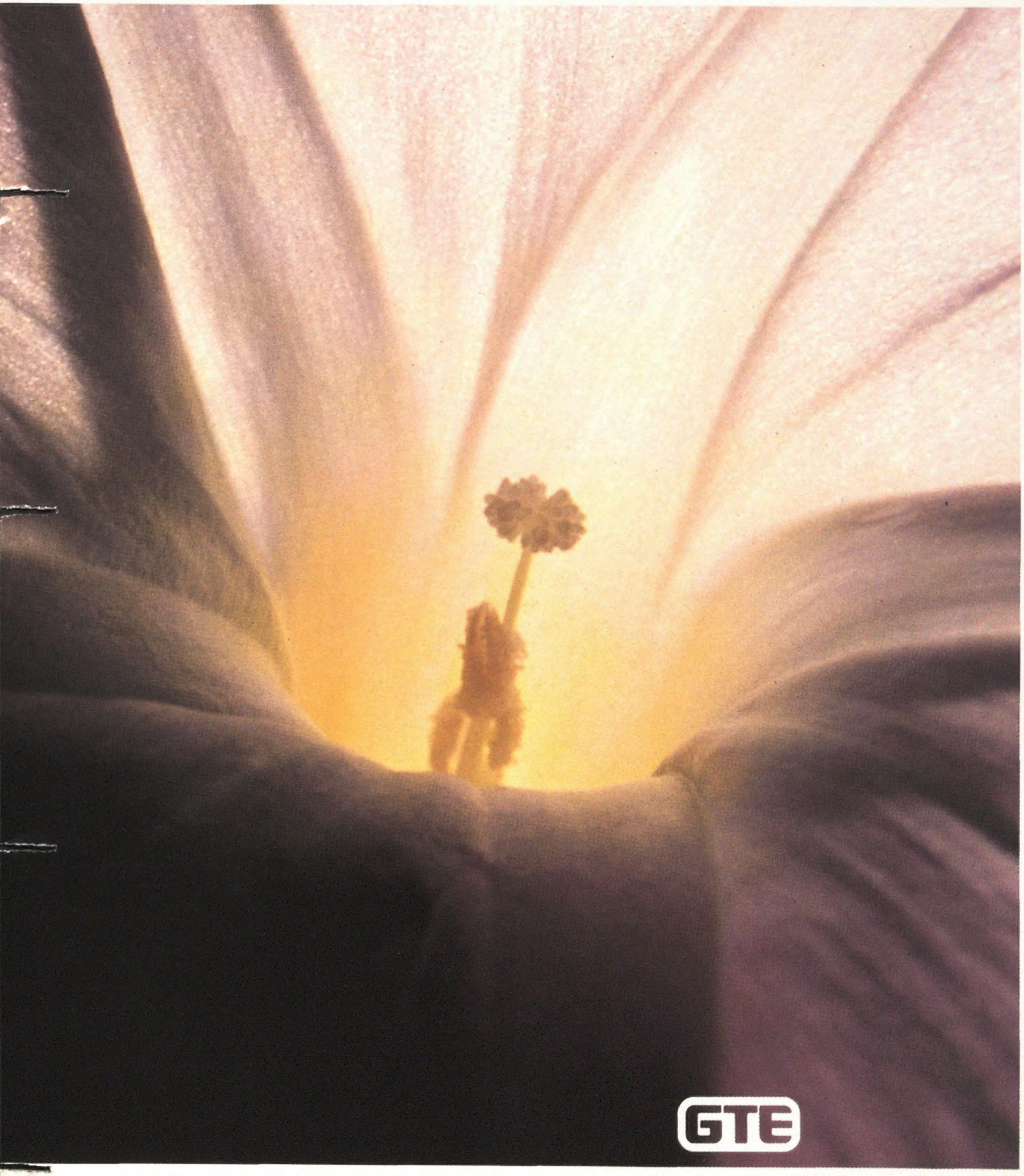

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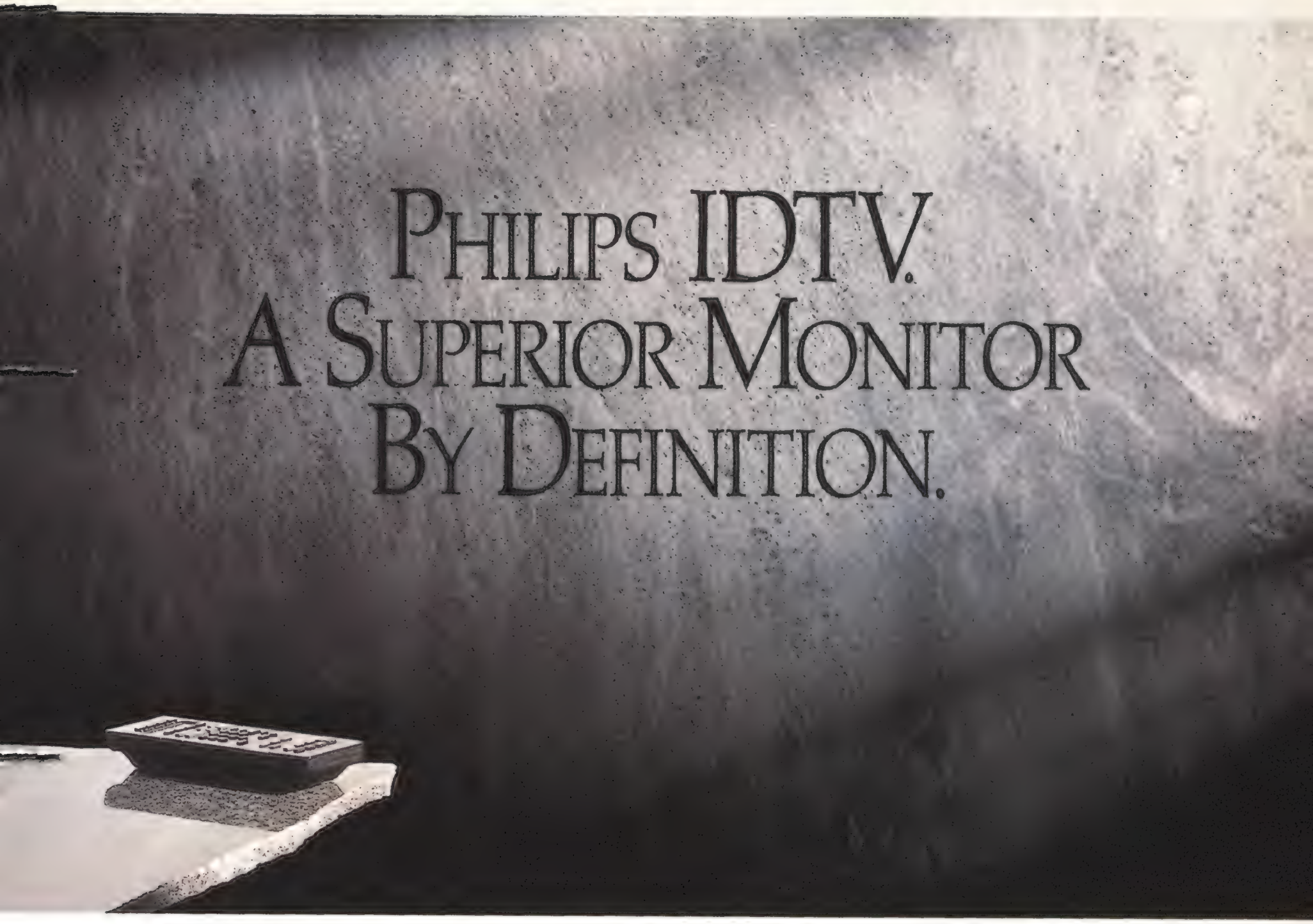

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Smithsonian horizons

In the African interior, the ivory trade and the slave trade helped each other become paying propositions

Curiously symbolizing profligate luxury as well as purity, ivory has for uncounted millennia been procured from vast distances and masterfully carved into objects of rare beauty. Since elephant tusks are its chief source, and since Man is the elephant's only serious predator, ivory is at the root of the African elephant's threatened extinction (the Asian elephant is already on the endangered list, and exports of ivory from India and Southeast Asia are banned). To be sure, there is a wider complex of causes. The tale is drawing to its grisly conclusion at this time largely as a reflex of the spread of automatic weapons in Africa.

Early Arab traders and European explorers found ivory a cheap, plentiful and marvelously versatile resource in the African interior. Carved figures, bracelets, war horns and ornaments of all kinds were present in profusion, and sometimes a hundred or more tusks encircled the graves of chiefs. But tusks also served as fencing for mundane cattle pens, as doorposts and roof beams in ordinary huts, as mallets for beating bark cloth, and even as wedges for splitting logs.

But if ivory could be acquired at the source for a few trinkets, the problem was to move it to the coast and thence into the stream of commerce. The grotesque solution lay in making the slave trade and the ivory trade one, each helping to make the other a paying proposition. Carrying the ivory, long lines of chained human victims furnished the raw material for slave auctions at ports like Zanzibar.

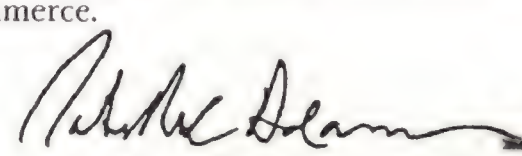
As Sir Henry Stanley wrote: "Every tusk, scrap and piece of ivory . . . has been steeped and dyed in blood. Every pound weight has cost the life of a man, woman or child. . . . It is simply incredible that because [of] ivory . . . the rich heart of Africa should be laid waste."

Among the most significant of the other ends of the supply-and-demand circuit, as the slave trade waned and the 19th century drew to a close, were factories in the Connecticut River Valley—Comstock, Cheney & Company at Ivoryton, and Pratt, Read & Company at Deep River. Among their varied products were billiard balls, dominoes, combs, spatulas, letter openers and the host of ornamental goods typical of the Victorian era. Most important, by far, were ivory piano keys. Pratt, Read alone supplied enough for nearly 100,000 pianos a year, representing the ghosts of more than a thousand elephants. How much the owners of these companies may have surmised about the trail of blood and death at the source of their supplies is problematical, although it is clear that the central figures at Pratt, Read were strongly committed abolitionists, and Read himself was an active stationmaster on the Underground Railroad.

By the 1970s, just to close the circle, major piano manufacturers in this country had shifted to plastic substitutes. Some 10,000 ivory keyboards still were being imported as late as 1986—partly because many concert pianists prefer ivory—but this was very modest in comparison with our peak production of 350,000 pianos, all clad in ivory, in 1910. On the other hand, according to the World Wildlife Fund, 4.5 million ivory carvings also were legally imported into this country in 1986, largely from Hong Kong. That number may be converted into about 285 tons of raw ivory, and thence into the deaths of more than 32,000 elephants. Most conservation experts agree that, tragically, at least 80 percent of this legally imported ivory was taken from poached (illegally killed) elephants.

Relatively stable prices suggest that supply and demand remained roughly in balance until around 1970. But since then, prices have risen more than twelvefold in real (inflation-adjusted) terms, paralleling ominous indications of mounting illegal as well as legal ivory exports and a subsequent increase in the availability of automatic weapons. Censuses of elephants now are accurate enough in some countries to chart general rates of decline: more than 42 percent for Africa as a whole since 1980—in 15 years 72 percent even in protected areas of Kenya, 87 percent in Tanzania's famed Serengeti National Park. Many African countries are now devoting unprecedented sums, and police efforts, to conservation. But the outcome is deeply in doubt. Precisely as ivory becomes scarcer and grows in value, the incentives to new generations of better-armed poachers also multiply.

A recent acquisition by the Smithsonian's National Museum of American History will illuminate a corner of this long and sobering story. Pratt, Read & Company, having absorbed Comstock, Cheney in 1936, closed its doors to the ivory trade in the 1970s and generously turned its valuable archives over to us. David Shayt, in the Division of Community Life, has begun—with others—to sort through them. Awaiting him is a richly detailed fabric to be woven of many complex strands: the transformation of an age-old trade by contemporary market forces; the destructive effect of new weapons on prospects for elephant conservation; and the linkages between human slavery and an important luxury product that for too long helped sustain the place of both in international commerce.



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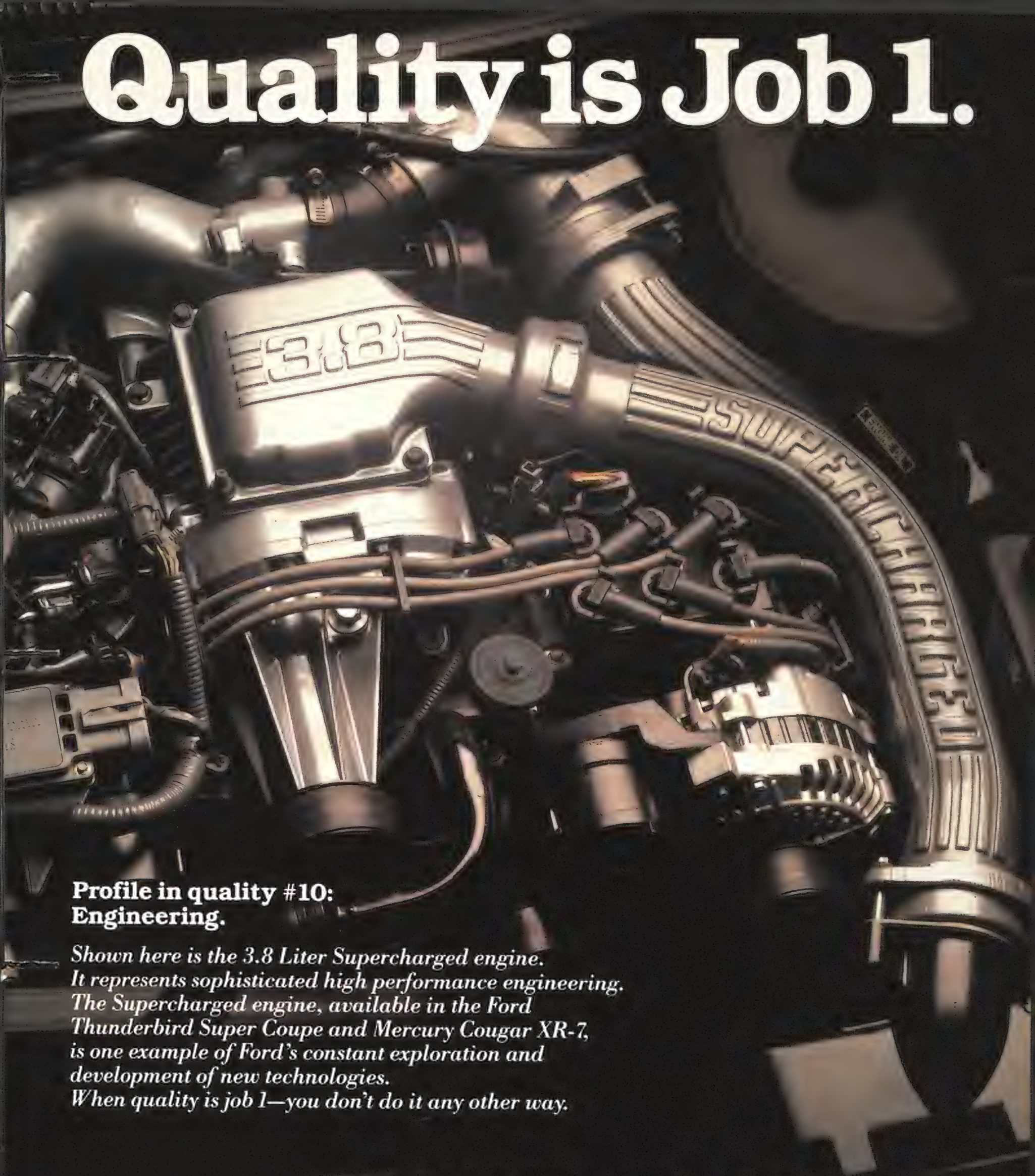

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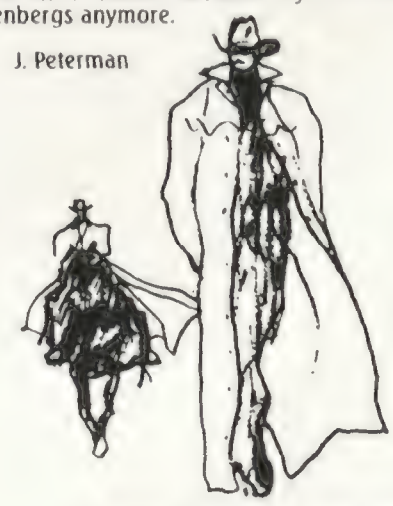

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Letters to the Editor

Beatrix Potter

Dear Sir: Timothy Foote's January article on Beatrix Potter revived for me the most significant day of my life—the day I met her! So young I couldn't even read her books without help, I was on holiday in the Lake District with my Scottish parents. One sunny afternoon we drove up to Sawrey along roads familiar to me from the travels of Peter Rabbit and Pigling Bland. We drew up in front of her house, but we would never have been so pushy as to call on her; we respected privacy.

So my father was enormously embarrassed when, as he balanced me on his shoulders to see over the wall, a large lady in comfortable tweeds came out of the house, a basket over one arm. Hastily he dumped me down, but my mother asked her politely: "Are you Miss Potter?" "Yes" said the lady, smiling, "I am." All her biographers claim she was so shy she repelled strangers, but that didn't happen to us. She held out her hand to me and asked me my name. Breathlessly, I told her and said I loved her books.

Finding his voice, my father explained he and my mother were interested in her garden. "Then come in and see it!" she said, and we did. She showed them her best plants, then turned to me again. "Would you like an egg, Helen, that Sally Henny-Penny laid this morning?" Would I! She took a brown egg from her basket and explained to me carefully how I could "blow" it so that it would "keep." It was a treasured possession until, inevitably, it rolled off a shelf and shattered.

We offered her a lift down to the village, but she said she'd rather walk. Then she shook my hand again, as if I were grown-up, and we went our respective ways.

That afternoon decided the direction my life would take. I was going to be a writer, and I'm glad to say I've seen my name in print many times. But my mental picture of what a writer should look like has always been a big lady in rumpsprung tweeds, the Margaret Rutherford type. She has a lovely open face, a countrywoman's complexion, and wisps of white hair escaping from under her soft, shapeless brown hat. Beatrix Potter.

Helen Lillie
Washington, D.C.

Dear Sir: As to Beatrix Potter's "becoming something of a celebrity, even on this side of the Atlantic," Anne Carroll Moore, of the New York Public Library, and Helen Dean Fish, children's editor at a New York publishing house, were corresponding with Beatrix Potter in the early 1920s and did much to introduce her work to American children. She appreciated the serious interest in it by American professionals. It was ironic that the reclusive Mrs. Heelis of Sawrey would grant interviews and take tea with her American admirers but refused for many years to have any contact with readers in her own country.

The continuous and continuing popularity of Beatrix Potter's work on this side of the Atlantic was further proved by the outcry against Penguin Books' decision a few years ago to publish a new version of *Peter Rabbit*, softening and simplifying the text and using photographs of animal puppets for illustrations. However, they redeemed themselves with their reissue of the original Warne edition with Potter's wonderful spare prose and luminous watercolors.

Diana S. Stevenson
Center Conway, New Hampshire

Dear Sir: I am happy to report that the lucid Victorian prose of Beatrix Potter seems to be indelibly impressed upon the memories of at least some members of today's generation of college students. My daughter, a sophomore at Boston University, tells of classmates who release pre-exam tension by running through dormitory halls shouting Squirrel Nutkin's rhyming riddle, "Arthur O'Bower has broken his band," and describes a party at which one suave young man, fortified with liquid refreshment, recited all of *Benjamin Bunny*—in French.

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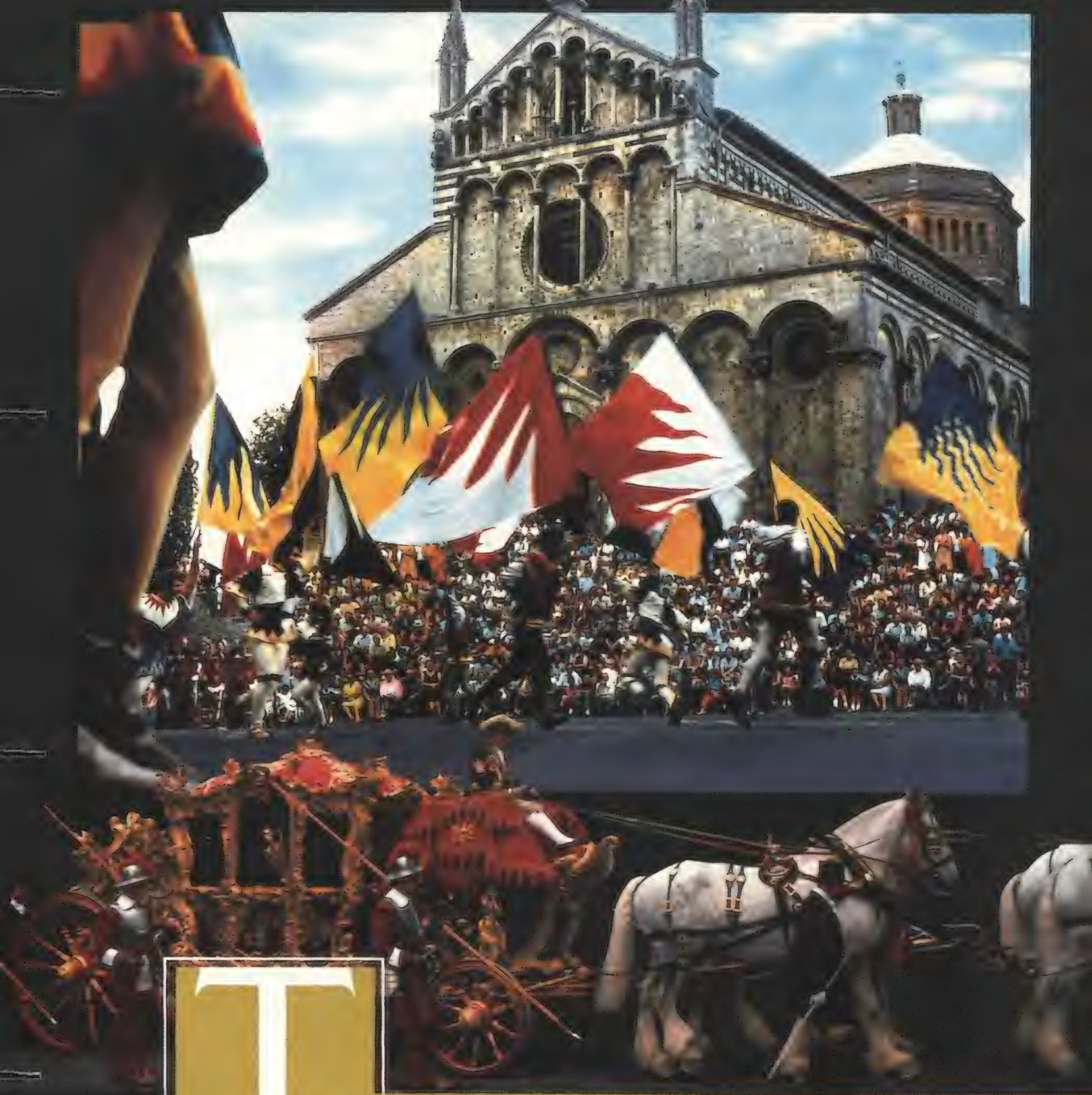

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In **Italy** (preceding page), flag bearers in medieval colors parade in Sienna, Arezzo and other venerable towns of Tuscany, then celebrate their age-old independence with fierce horseraces, archery competitions and feasts.

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The artistic heritage of Europe is unmatched, from cave paintings to Rembrandt and Picasso. **Spain's** master, Velázquez, heralded a new realism in this portrait of the Infanta Margarita and her tireless maids, on view in the Prado museum.

Europe's artistic masterpieces.

fairytale castles.

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Europe's mariners found the world beyond the seas and brought back knowledge, wealth and power. Portugal's dramatic Monument to the Navigators salutes their incredible daring and achievement.

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at the spectacular monuments and historic cities.

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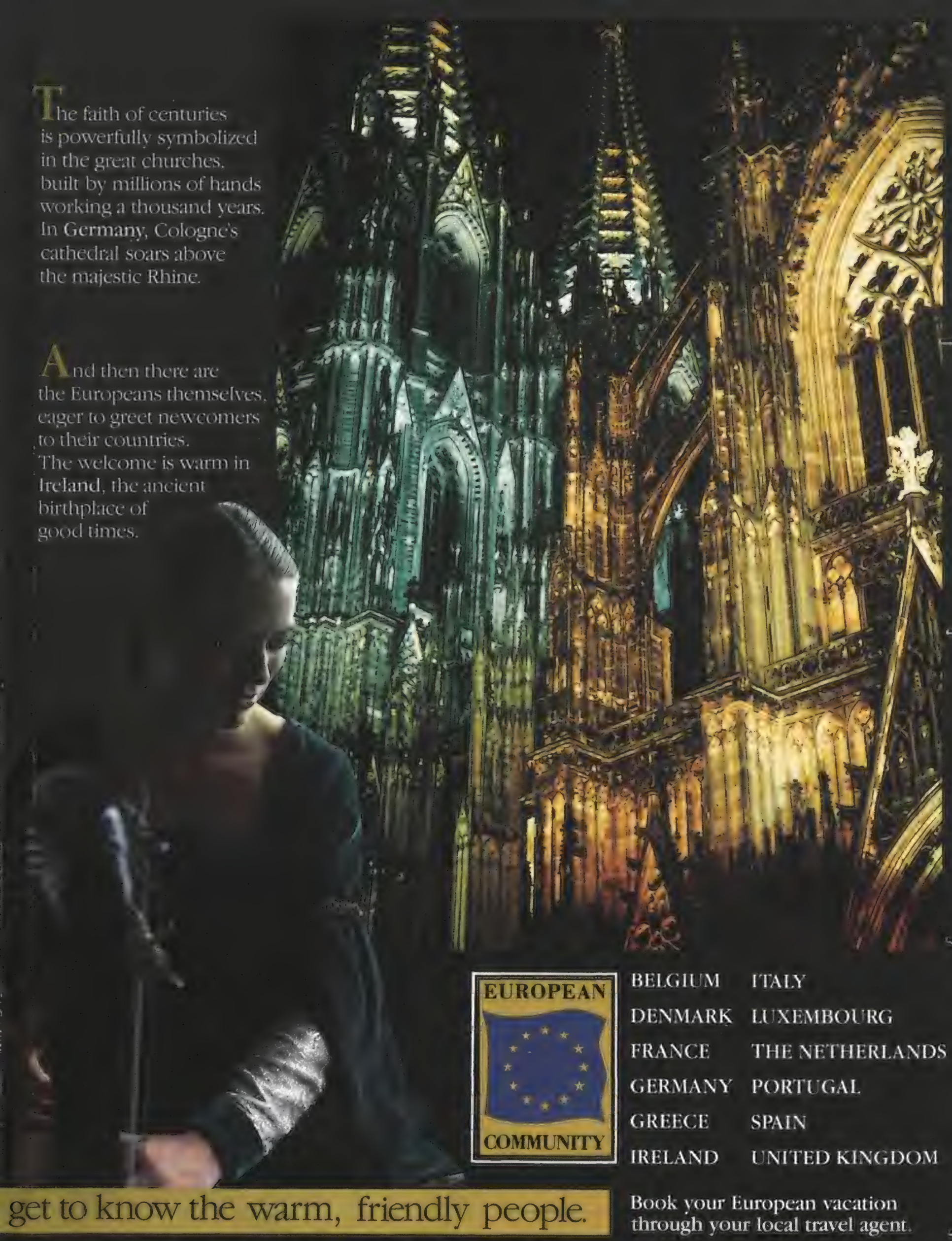
The faith of centuries is powerfully symbolized in the great churches, built by millions of hands working a thousand years. In **Germany**, Cologne's cathedral soars above the majestic Rhine.

And then there are the Europeans themselves, eager to greet newcomers to their countries. The welcome is warm in **Ireland**, the ancient birthplace of good times.



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Young people with such a literary background cannot help but treat the English language with special care.
Mary W. Cox
North Miami, Florida

Dear Sir: For many years every article I have seen about Beatrix Potter has been illustrated by the same photograph of her standing in the doorway of her house, always dated 1907 or, as in the inset on page 81 of your article, 1905. Actually, the picture was taken by my maternal grandfather, Charles G. Y. King, in 1913; in his album it is labeled "Miss Beatrix Potter at Hill Top Farm."

Here is Grandfather's snapshot from which your detail was taken, showing a winsome Miss Potter outside her vine-festooned farmhouse at Sawrey:

Miss Potter wrote, in a letter to him dated May 27, 1913: "The photographs have come out remarkably well, your lens must be a very good one. . . . The animals have come out very good—so have some of myself: I am wondering if I am really quite so fat as the stout female with my very small ducklings appears to be. . . . I wish the house had not been in such an upset condition—any way you will be able to tell your grandchildren that you have seen where Tom Kitten lived, it will make the books still more real to them. . . ."
Kenneth G. Hecht
Wilmette, Illinois

Poison frogs

Dear Sir: Is it not possible that the reason dart-poison frogs do not secrete toxins in captivity is that in the captive environment there are none of the predators the toxins were originally intended to discourage, and nature would not waste the animal's time and energy in producing that which is not needed? It may be that, like endorphins and other hormones in Man and other animals, the toxins are produced in measurable quantities in response to stress.
Anthony P. Longo
Toms River, New Jersey

Chemist John W. Daly tells us his lab at the National Institutes of Health began to test that theory last month. Within three to four months they hope to know if, in fact, the lack of stress in these very predictable environments may reduce the frogs' toxicity.

Some of his colleagues, however, believe that diet may be affecting the frogs' ability to produce the toxins: in captivity they receive only fruit flies and crickets. Ed.

Glacier pilots

Dear Sir: My father, Glen Hudson, established Hudson Air Service in 1947 shortly before Don Sheldon, who had been flying in the Talkeetna area, moved in with his partner, Stub Morrison. Bradford Washburn contacted my father in 1949 to fly him onto Mount McKinley's Kahiltna Glacier. Father agreed, and thereafter established the first base camp on Kahiltna.

After Glen's untimely death in 1951 his younger brother, Cliff, took over Hudson Air Service and became known as one of the finest and, certainly, safest pilots in Alaska. Cliff may resemble a "panhandler," but in fact is a true gentleman who has always shared his knowledge with other local pilots, including Geeting and Okonek, both of whom he broke in.

Rivalries have always been strong in Talkeetna. Years before Cliff's fistfight with Don Sheldon, there was a similar match with my father against Sheldon and Morrison on Main Street. It would seem the town will never be big enough for more than one daredevil.
Marilyn Hudson
Louisville, Kentucky

Dear Sir: We were disappointed that you did not mention the name of the

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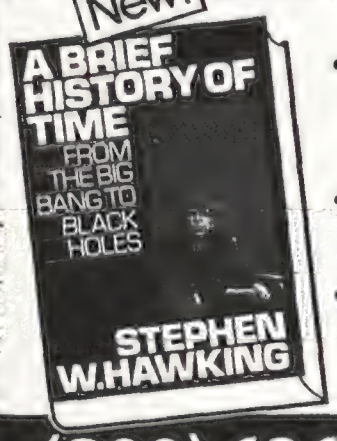

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skilled glacier pilot in your cover photograph. David Lee has been flying the glaciers for years.
M. J. Fitzgerald
Talkeetna

Dear Sir: Most tourists to Alaska are the poorer because a visit to Talkeetna is not included in their itinerary.

As one approaches, a homemade sign proclaims "Welcome to Beautiful Downtown Talkeetna." Around it are weeds almost as high as the sign.

This unique village boasts an exciting museum in a converted "little red schoolhouse," the Fairview Inn (where, after President Harding had driven the golden spike for the Alaska Railroad, he met with a few friends for drinks; a sign notes: "Many residents proudly boast that President Harding was poisoned at the Fairview Inn"), the Annual Moose Droppings Festival and the nearby Bartlett Earth Station.
The Rev. LeRoy Davis
Saluda, Virginia

Influenza

Dear Sir: In 1918 I attended the sixth grade at Lincoln School in Waterloo, Iowa, and remember wearing a mask. The authorities also provided and permitted us to smoke medicated cigarettes, called Cubebs, during certain periods of the day in the hallways.

I tried smoking one at home and got the razor-strap treatment. It cured my desire for cigarettes to this day.
Arthur Kokotan
St. Louis, Missouri

Dear Sir: One preventative measure not mentioned was the use of asafetida. I attended grammar school in 1918 and all of us children had to wear a tobacco sack of the foul-smelling material around our necks. Only one who has sat in a steam-heated schoolroom with 50 other children, all with that same sack around their necks, can appreciate the smell that resulted.
Jack Douglass
La Mirada, California

Dear Sir: I was a very healthy 14-year-old when I contracted the flu in October 1918. Remedies of all sorts were printed in newspapers, as doctors were either in short supply or did not know what to do. Consequently, my mother fried onions in heavy grease and put them, hot, into a bag made out of my

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woolen underwear; it completely covered my chest. She repeated this nostrum for 72 hours. When the doctor arrived three days after her first call he said she'd probably saved my life and that he would recommend her treatment to all his patients, as he had no better remedy and had seen so many deaths.
Ruth C. Wigginton
Grand Rapids, Michigan

Dear Sir: I enlisted in the Student Army Training Corps in September 1918 and was stationed at the University of Kansas in Lawrence. Early in October, standing at attention in "company front" formation after a long marching drill, men began to collapse. The flu epidemic had reached our camp.

A few days later, an officer ordered us to set up some iron cots in the barracks and put blankets on them. We were designated hospital orderlies, were issued white armbands and worked from 4 P.M. to midnight throughout the epidemic. I never saw an Army doctor or nurse. We took and charted temperatures, but with no sanitizing equipment we had no means of sterilizing thermometers. So we merely wiped them on our pants as we went from patient to patient. One with no fever received a food tray, one with fever was given quinine, the only medicine I saw during the epidemic.

The wonder of it is not that so many died, but rather that anyone survived.
Dewey W. Graff
Camdenton, Missouri

Dear Sir: Just a few days after the Volstead Act became law in January 1920, my 9-year-old sister became desperately ill with influenza. Finally the doctor told our father, "I can't do anything more for this child. The drugstores in town have sold out of medicinal whiskey, but if you know where you can get some, the only thing I can suggest is that you get as much of it down this girl as you possibly can." So our father walked more than a mile on a cold January night to the home of a bootlegger, brought home a bottle of moonshine and did as the doctor suggested. Today my sister, Agnes French, is alive and well in Bicknell, Indiana. In the days when we were growing up, before and during Prohibition, a hot toddy was the home remedy for everything from a toothache to snakebite.
John R. Thomson
Park Ridge, Illinois

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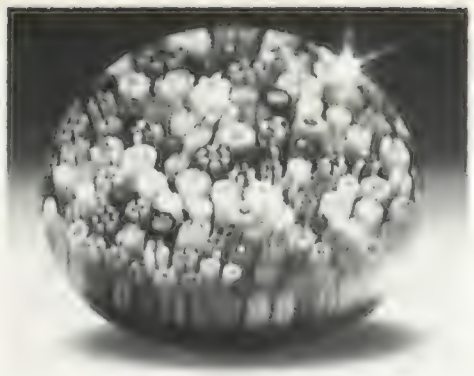

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Around the Mall and beyond

I had driven to this nice white farmhouse in the rain-sodden Berkshire Hills of Massachusetts to get to know Bill MacLeish. But a chorus of barks from two shepherds—one German, one Australian—had greeted me so vociferously that I almost cringed at the sudden blare of publicity. I'm just a journalist, not Gorbachev.

The barrage raised muffled echoes from the dripping woods, and also my host from his study in the shedlike extension that, New England-style, grew out from the house. He waved, then turned and spoke quietly to the dogs in their broad enclosure. Silence. "They just like to know what's going on," he said.

If you look at page 42 of this issue you'll see why I had come to call on William MacLeish: he's the author of the new book *The Gulf Stream: Encounters with the Blue God*, just out from Houghton Mifflin, and of its adaptation as a two-part article for this magazine. He is also the writer and narrator of an hour-long *NOVA* program on the same topic, airing on February 28. His story, rich with personal participation, indicated to me that he was a doer as well as a writer. A look at him reinforced that assessment: not tall, but well-knit, with little fat on him, short-cropped beard, thoughtful eyes, ready smile. He moves quickly and surely. He can walk up a long hill without panting.

One more thing: Bill MacLeish is the younger son of one of our most famous Americans, the late Archibald MacLeish, poet, dramatist, essayist, journalist, statesman, Librarian of Congress and winner of three Pulitzer Prizes. How, I wondered, did a sapling grow strong in the shade of such a tree?

Understanding Bill meant visiting the

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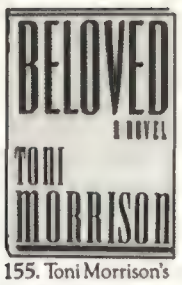

155. Toni Morrison's Pulitzer Prize-winner. "Extraordinary."—N.Y. Times.

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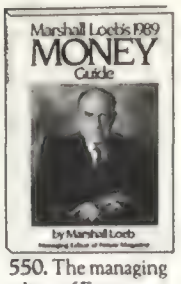

550. The managing editor of *Fortune* magazine gives investing advice for 1989.

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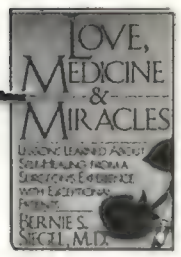

134. A surgeon outlines his prescriptions for recovery.

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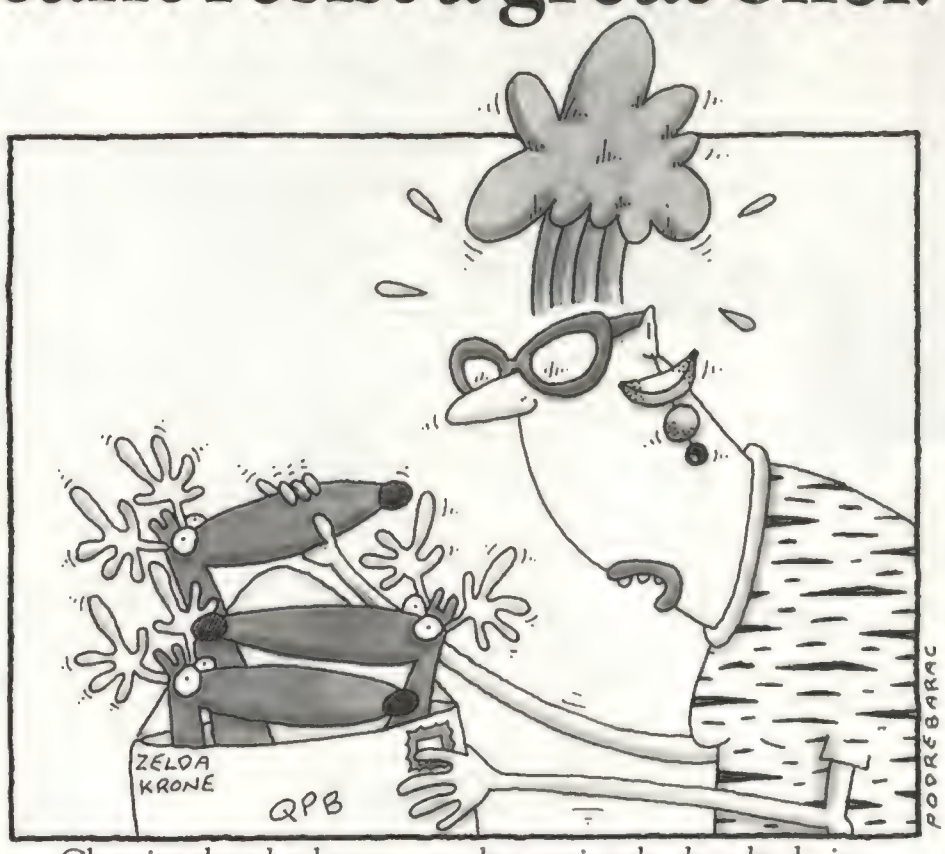
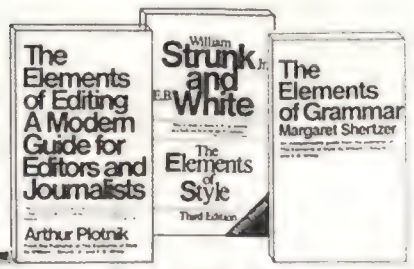


Choosing three books was easy, but getting the three bucks into the envelope proved to be beyond Zelda Krone's capabilities.



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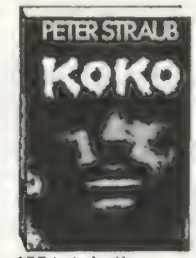

*554. A thriller about 4 Vietnam Vets in search of a murderer, by the author of *Ghost Story.*

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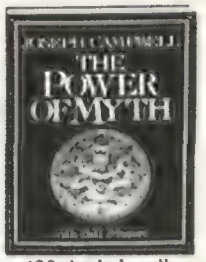

423. A scholar tells how myths have shaped our lives. A PBS TV series.

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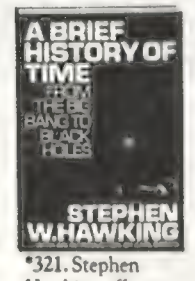

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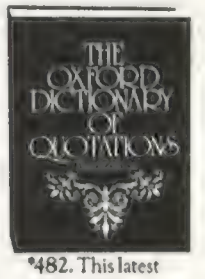

*482. This latest edition of the famous dictionary has 40,000 memorable quotations.

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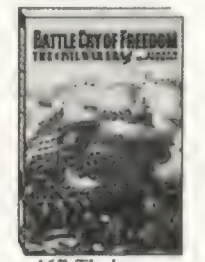

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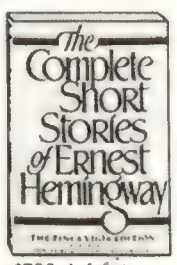

*793. A definitive one-volume collection including seven previously unpublished tales.

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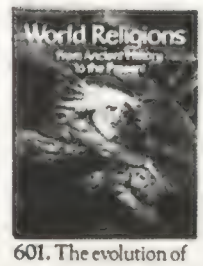

601. The evolution of beliefs throughout history. Illustrated.

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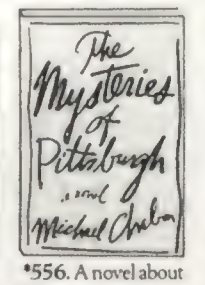

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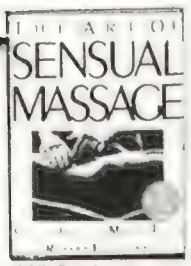

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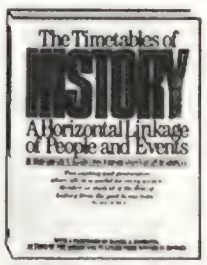

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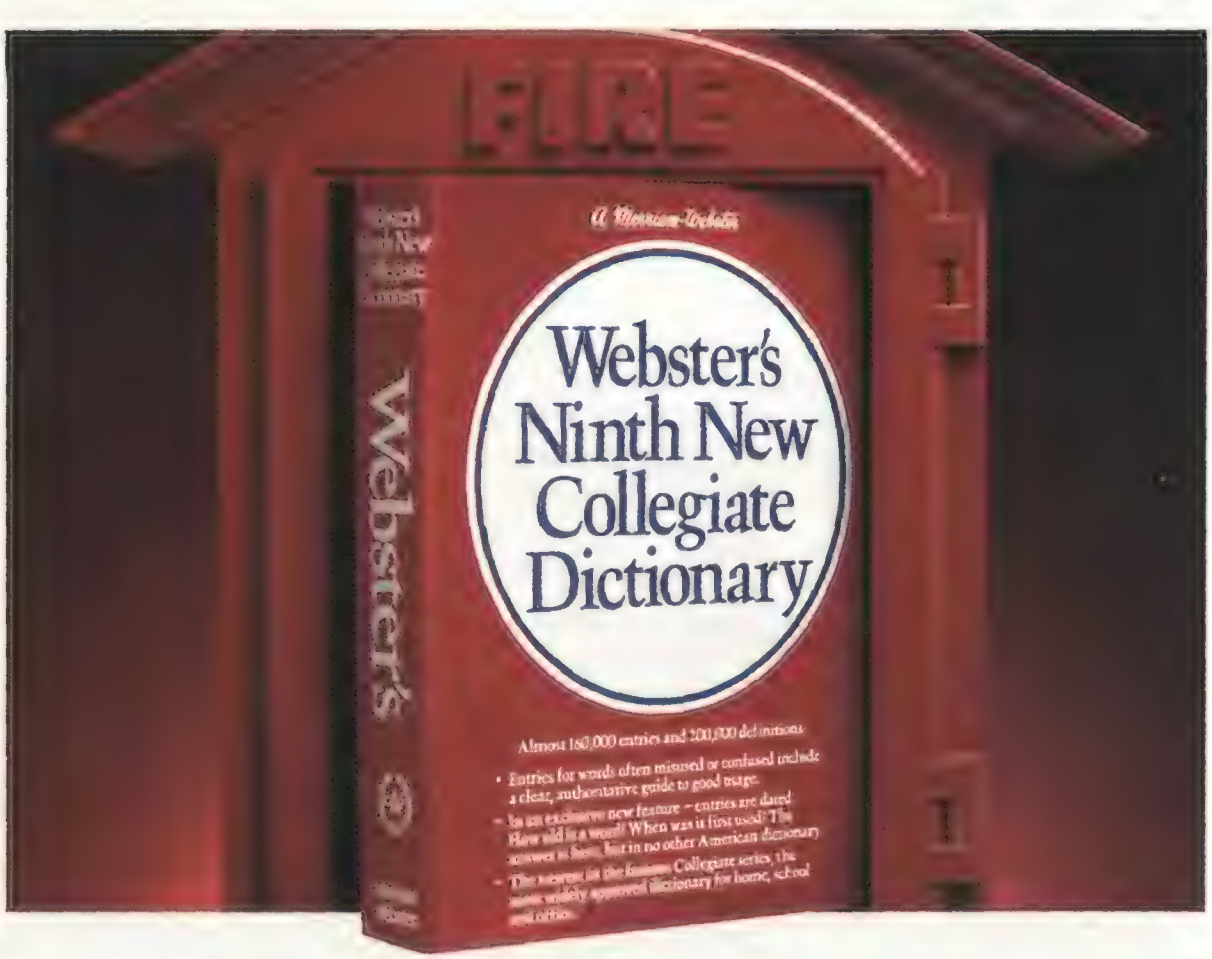

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environment that shaped him. I had read "The Silver Whistler," his moving memory of his father, in the October 1983 issue of SMITHSONIAN. Now I wanted to see the place, Uphill Farm, where he had done so much growing up.

It's a half-hour drive along small, high-crowned roads that wind over hills and beside rushing streams. As we set out, Bill paused beside the dog enclosure and rolled down his window. "Listen, you two. I won't be gone long. I'll be back before dark. OK?"

They both looked at him thoughtfully, and then, I swear, they nodded and went quietly about their business.

We didn't chatter during the drive, but Bill reacted tersely to ideas as they occurred. Passing a parked pickup truck: "Damned hunters are all over the place this time of year. I used to hunt. Can't stand it now." Passing a weedy meadow, once a pasture: "Hardly anyone raises dairy cattle anymore, so the fields revert to brush. The thing is to just sell out to developers and make a bundle."

We dropped through pine forest, turned sharply, climbed again. "The people who bought Dad's house have kept it exactly as it was, except for one addition. They say they'll keep the land. God, I hope so."

We climbed a long hill, turning, glimpsing a steep hayfield beyond a stone wall. And there, above us, looking down at us and out at the hills to the east and west, stood the family home.

Coming level with the house, we reached a break in the wall. The stone gave way to white palings curving in, like cupped hands, to a little gate. It's a welcoming design, and for a moment I could almost see figures pushing open the gate—the Hemingways, the Mark

Bill MacLeish takes break from tether-diving in Bahamas during *NOVA* shoot.

At first she thought it was the Golden Alaska Caviar, or the chilled vodka. But when his face took on that ear to ear grin, the one she hadn't seen for a while, she knew it was more.

"Let's get married," he said.

"We're already married," she said.

"Again," he said.

And over Pink Lobster Bisque and Peppered Canneloni they laughed and planned a shipboard wedding.

And when the last morsel of Royal Pheasant was gone, when the Gateau Napoleon had been reduced to crumbs, it was written in stone.

Wednesday morning, on the ssCostaRiviera, somewhere between Grand Cayman and Cozumel, Lido Deck aft, David and Jennie Curland got married again. A waiter, Giovanni D'Angelo, stood up for David. The Chief Purser, Lorenzo Dasso, gave the bride away. And Captain Elio Mandrilli pronounced them man and wife.

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Van Dorens, the Sandburgs, the Dos Passoses, the Dean Achesons, the Felix Frankfurters—and the MacLeishes coming down the path to greet them.

Bill is haunted like that all the time. "As a youngster, I knew Dad was different. I didn't know why, but boy, was he famous! And there was this steady procession of people coming to see him, and I realized that they were famous, too."

It sounds like a wonderful boyhood, running wild on 200 acres, meeting key people in the worlds of literature and government, hearing your father read aloud a few freshly minted lines to his wife. "If he wrote a dozen lines in a day," says Bill, "he was delighted." And the dinners: "Guests most weekends. Brilliant talk." And then the music after dinner. Bill's mother was a concert singer, and in the evenings music poured from that wild hillside.

But it wasn't all joy. "The house wasn't run for children. Mother ran it for Dad. He came first. Always." Bill's brother, Ken, 11 years older, was enrolled in boarding school at about age 5. Bill, as a child, was sent to Farmington, Connecticut, with his sister, Mary, to live with their grandfather for the school year when their parents were in New York or abroad. "That," he told me, "was the unhappy part of my childhood that every writer is supposed to have. I learned then to tell myself stories."

Uphill Farm meant summer vacation and close association with their father. Did they compete with him?

"Ken was always driven to. I struggled to keep up with both of them. I don't think I measure myself against Dad anymore, though I'm always conscious of him. He had passions. He believed in myth and also in duty. 'A man should do this,' he would say. 'A man should do that.' I really felt I was getting even closer to him toward the end of his life."

When he got out of college in 1950, Bill could think of no other course to take than to follow his father and older brother into writing. "I was totally under the sway of the two of them, so off I went, right in their tracks."

Archibald MacLeish had been a star writer for *Fortune*, and Ken MacLeish was on the staff of *Life*, eventually to leave it for *National Geographic* (where I knew him fondly). So Bill competed for a job with *Time* and won a slot at the Dallas bureau. The Korean War called him away. He went into armor, trained at Fort Knox and ended up a tank-tactics instructor with a lasting respect for the training staff. "I learned more there than in four years at Yale," he maintains. He also found time to marry, later fathering two daughters.

After the war, he bounced from one academic or foundation job to another, all exciting, rewarding—and temporary. Off to Peru with the Institute of Current World Affairs—he's loved South America since his first trip as a boy. Back to the United States to work for *Fortune*, then Latin America again with a small magazine. Picked up by Cornell for a Latin American project, then to New York to become executive director of the Center for Inter-American Relations. Then Yale's president, the late Kingman Brewster, asked him to be his special assistant.

This put MacLeish on the firing line

The Buckingham Wile Company, N.Y. ©1988. 40% Alc. by Vol.

He knew then, after the music, the dancing, and the long, long, conversations over B&B, that

during the troubles there in 1969 and '70. "Once when the Yale campus situation got tense, the Connecticut National Guard was alerted. It was a time of extreme tension. Brewster managed to defuse things. He also opened the dining halls to feed throngs of people, including the militants who wanted to burn the university down. A strange and also wonderful time."

Bill's involvement with salt water began when he became editor and publisher of *Oceanus*, magazine of the Woods Hole Oceanographic Institution. He raised circulation, joined research cruises, edited copiously and began writing, including his first article for SMITHSONIAN in April 1979 (it was about oceans and weather). The idea for a big episodic book on the Gulf Stream followed inevitably. "So," he says, "after being all the things I have been, I now call myself a writer."

Researching and writing *The Gulf Stream* has delighted and obsessed him—and also once scared him thoroughly. "I'd been tether-diving off the Bahamas, and I surfaced and swam leisurely to the dive boat, then unclipped my gear and handed tanks and mask aboard, taking my time. I climbed on board myself, lazily, and then I looked back down into the water. And I saw a shark that apparently had been following me all that time, watching me, waiting. That scared the hell out of me."

Back at his farm that afternoon, I followed him into the home he shares with his second wife, poet Elizabeth Libbey, and upstairs to the warm, finished room where he works. The view is lovely and pastoral, but, he says sternly, "I write facing a blank wall. I don't dare look out the window." He has an old word processor and works mostly standing up; also he exercises on a machine that simulates the action of cross-country skiing—unless enough snow has piled up to allow for the real thing.

More and more he thinks in terms of the environment. "Perhaps it started when I first saw what developers had done to Yorktown Heights, New York. That's about 40 miles north of New York City, and was a lovely, natural place when I was a boy. I looked at the mess they'd made of it and howled in anger. Now, after traveling so much on this planet, I think of the whole problem, the loss of land, the despoiling of water. We need an environmental religion, you see. And we don't have one."

While he was at sea working on *The Gulf Stream*, Bill thought about the next book he would write. It's an ecological history of our country before white settlement, when, as he says, "cod ran to 200 pounds, 16-foot sturgeon crowded the mouth of the Connecticut River and oysters were plate-size." It's to be called *The Day Before America*, and Houghton will publish it.

Reluctantly, I said goodbye to this delightful, thoughtful enthusiast, hammering away amid the fields where deer come at evening, and letting his mind sweep far beyond the Berkshires. The rain had eased off as I started down the driveway. At the dog enclosure, I rolled down the window. "Hey, you guys," I called, "I have to go now. But I'll be back. OK?"

They said it was OK.

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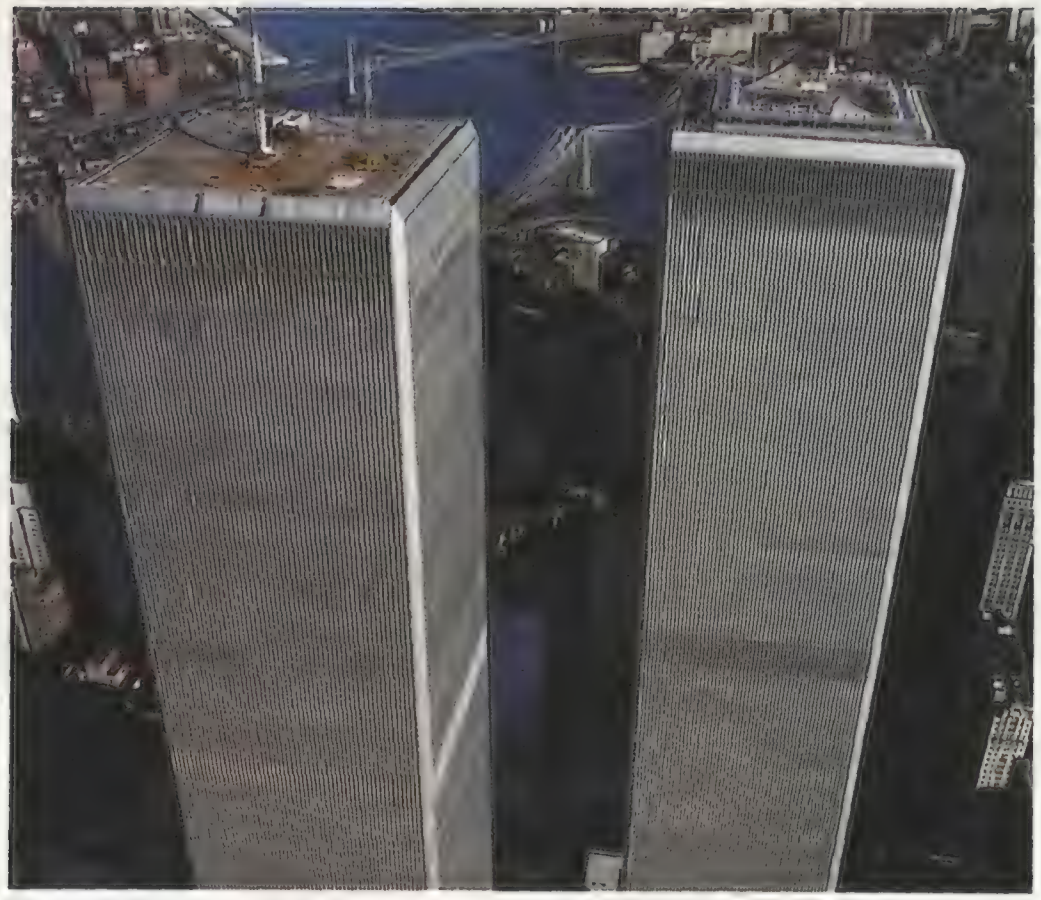

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Phenomena, comment and notes

A new ecological society will devote itself to the toughest mission of all: the restoration of land left for dead

For most of us, science is highly trained people doing experiments to find out how the world works. They may pour things into test tubes or hurl subatomic particles at one another in giant accelerators (see page 106); the common thread is that the scientists initiate and control the experiment. In some fields, however, it is impractical to do real experiments. You definitely do not want a star to form in your physics building. Ecology is another science in which experimentation is the exception. You can fiddle with the microbes in a flask, or even amphibians in tubs of water, but not many people tamper with whole ecosystems for the sake of biological insight. Instead, ecologists spend years as outside observers, identifying, counting, measuring until they feel they understand the system.

Most of the planet has been subjected to massive, unintended ecological experimentation, nearly always to the detriment of the biosphere, of course. Natural ecosystems are not easy to find these days. Stand on a hillside in coastal California among the exotic grasses and Australian eucalyptus trees: Is it natural? Walk along a northern New England coast kept free of sediment-trapping plants by an introduced snail called the periwinkle: Is it natural? The science of ecology is acquiring as many levels as a lit major's interpretation of *Moby Dick*. You move from trying to understand the ecology of what exists now to finding out the ecology of the ecosystem that existed when the site really was

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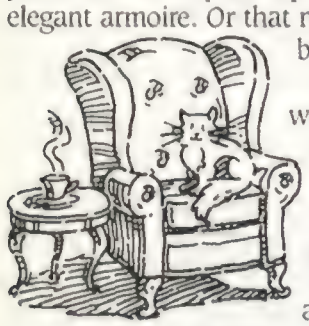

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"natural." How do you know you have it right? One way, a classic part of the scientific method, is to try to reproduce it. If you can build an ecosystem so well that it sustains itself, resists the intrusion of alien species and bounces back from the trauma of fire and storm, you may be close to the real thing.

More than scientific curiosity is involved. Most conservation groups are working to save at least pieces of the last few relatively pristine areas on the planet; we have progressed from trying to save single, pretty species to saving the whole habitats they require. There are not many such places left, however, especially in the developed countries. But another way to have part of our only planet in a natural, healthy state is beginning to open to us. We can now come closer then ever before to restoring the original, natural ecosystems on land that has been trashed. This country—and the world—has no lack of land that has been strip-mined, farm fields that have been exhausted, forests that have been clear-cut, marshes that have been filled.

Once we start to restore, we are no longer retreating, trying only to slow the wave of destruction. We begin to actually advance, to regain lost ground. Can we really do it, or is the idea only hubris, human arrogance rearing its head one more time? More than 400 practitioners spent five January days in Oakland, California, comparing notes at the first-ever annual meeting of the brand-new Society for Ecological Restoration and Management. The short answer is: yes, we can really do it—to some degree. At worst we can produce something that mimics the real thing and that, given enough time, could become the real thing. (One biologist suggested a name change to the "Society for Approximations.")

The attendees work at universities; in local, state and federal agencies; and for landscape architecture and environmental consulting firms. All learn by doing: restoring streams in Philadelphia parks or in the California hills; revegetating mine spoil in Utah or land torn up by tracked vehicles on an Army base in Colorado; or blending 600 razed residential sites into the landscape at Indiana Dunes National Lakeshore.

A guiding force behind the new society is a plant physiologist and journalist at the University of Wisconsin-Madison Arboretum, William R. Jordan III. The editor of *Restoration and Management Notes* since the journal began in 1981, Jordan thinks the time is right for the new society. Unprecedented media attention to the plight of the Earth will focus the attention of citizen and government alike on the potential of ecological restoration. A tall man, thin as a marathoner, Jordan is the opposite of the grim reformer. Restoration ecology will catch on, he says, because it is fun. Nature lovers, instead of just walking reverently through the woods, guidebook in hand, like so many visitors to a cathedral, can plunge in eagerly, even greedily, up to their elbows. "It gives one business to transact, takes us out of our isolation and puts us back inside nature," Jordan says. "We can take our science and our art back to the very edge of nature."

At the same time, Jordan and many of the society members worry about the ecological swap known as mitigation. Paradoxically, it is heightened environmental awareness on the part of the public that has led to the widespread

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adoption of the idea. Basically, mitigation requires a developer to re-create habitats in exchange for ones he destroys. If a new building obliterates wetlands, for example, the builder is required to create new wetlands somewhere else. And in point of fact, it is that kind of work that supports many of the people at the meeting. The members made it clear that they consider restoration only a last resort—not a substitute for preservation. They do not want anyone to think that it is all right to destroy habitat because restoration ecologists like themselves can always replace it.

"Everyone here is a preservationist," Jordan said. "No one wants to be used as an excuse for destruction."

The protestation comes from people who know better than anyone else by how much they are falling short of the original. Joy Zedler and her graduate students at San Diego State University, for example, have made detailed comparisons of natural and man-made salt marshes. Natural marshes have thicker cover, twice the organic matter in the soil, more species and nearly four times as many individual invertebrates as do their man-made counterparts. So far, no created marsh in the San Diego area has attracted an endangered species. The marsh builders had hoped to see at least one endangered plant, a hemiparasitic annual called saltmarsh bird's beak, take hold, and the return of two endangered avian subspecies, the light-footed clapper rail and the California least tern. Zedler is not sure created marshes will ever match natural ones. Today, she points out, we must contend with exotic species of plants that crowd out the natives. Worse, the hydrology is changing, making it impossible to duplicate what once was there. "We cannot replace a natural marsh," she said.

The more we learn, though, the closer we can come. The effort is not new. Robert E. Grese of the University of Michigan took the meeting back to turn-of-the-century Chicago, where Ossian Cole Simonds was relandscaping Graceland Cemetery with native plants then considered weeds, and Jens Jensen was re-creating prairie wetlands in Columbus Park well enough to attract great blue herons back to the city. New work in late 20th-century Chicago was a highlight of the January meeting. Steve Packard of the Illinois Nature Conservancy recounted the detective work and botanical experimentation that led to

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Pictures of Dolason Hills Prairie in Redwood National Park, California, were taken two years apart. Logging road shown at left is nearly gone at right.

the reestablishment of a tree-studded grassland habitat that had been lost before ecology was born, the tallgrass savanna. When the first settlers suppressed fire, the open "parkland" disappeared under impenetrable scrub. Packard's first attempts to reassemble a savanna in Chicago fizzled. He spent several years puzzling over the problem, searching old plant lists and tinkering with the community—using seeds he and his colleagues collected from golf course roughs, railroad rights-of-way, cemetery corners and the edges of horse paths. Finally it all came together, leading to a whole new understanding of what the savannas had really been. Now several restored "parklands" are flourishing in the Chicago area, and a number of areas long unrecognized as savannas have been rediscovered.

One of the first attempts at pure restoration began in 1936 when a young botanist, Ted Sperry, arrived in Madison to oversee Civilian Conservation Corps workers planting a prairie at the University of Wisconsin. The idea to create examples of all the habitats in the state had come from a professor of wildlife management there, Aldo Leopold (SMITHSONIAN, October 1980). Fifty-three years later, a still-vigorous Sperry opened the first meeting of the Society for Ecological Restoration and Management. Later in the week a group of attendees marked the meeting with a little restoration of their own. They climbed the hills of adjoining Claremont Canyon Regional Preserve to plant native trees, live oaks and buckeyes.

For me the meeting ended with the Friday field trips. I looked at new salt marshes on the eastern and southern shores of San Francisco Bay, one of which treats effluent from a sewage plant, another created to mitigate construction on the edge of the bay. They are not yet heavily vegetated, and visually they look a lot like the wasteland all around them. But I could not help noticing that both were packed with diving ducks, dabbling ducks, wading birds, shore feeders and the hawks—in every direction—that were feeding on all of them. In at least a couple of places, the tide is turning.

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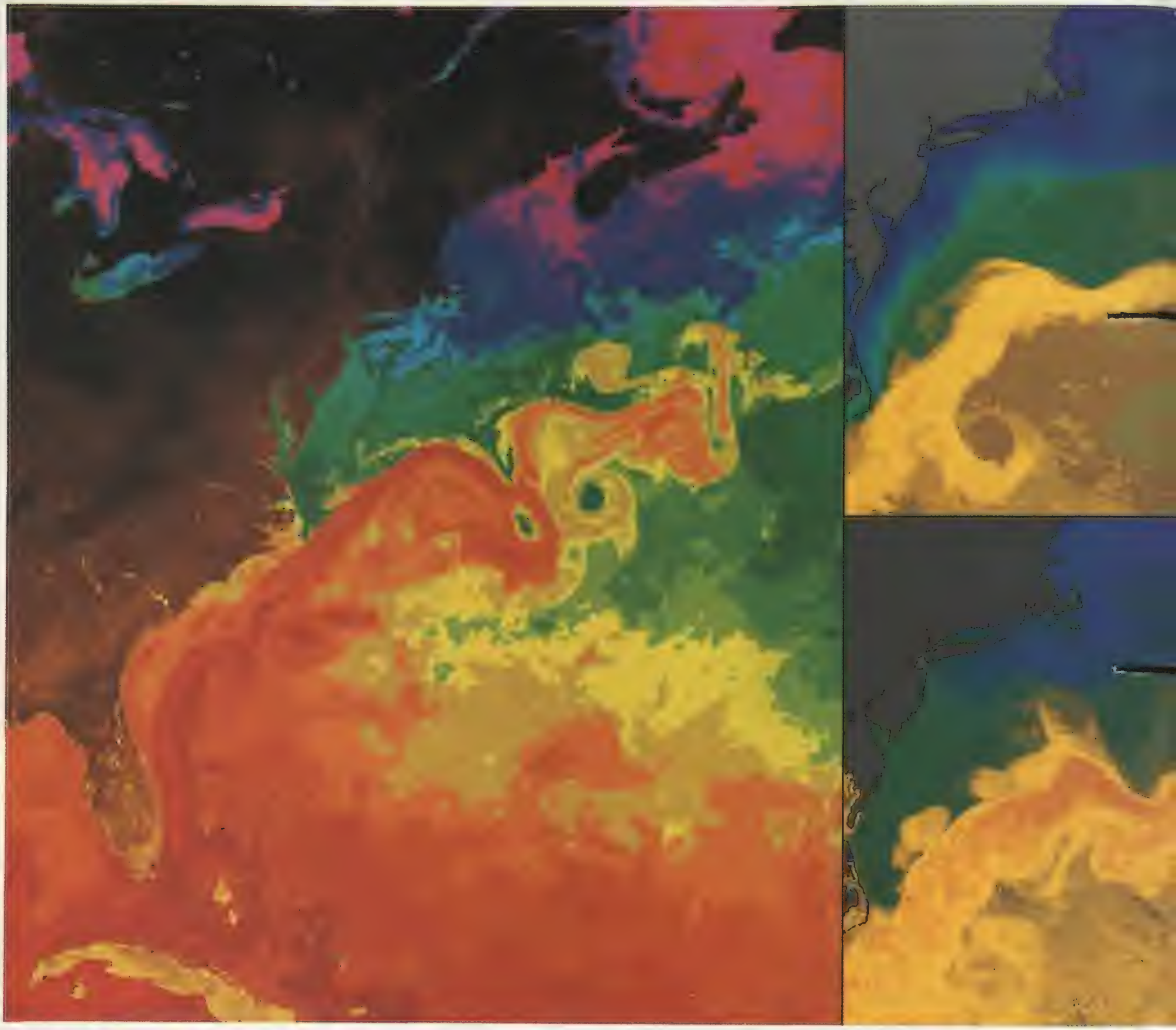
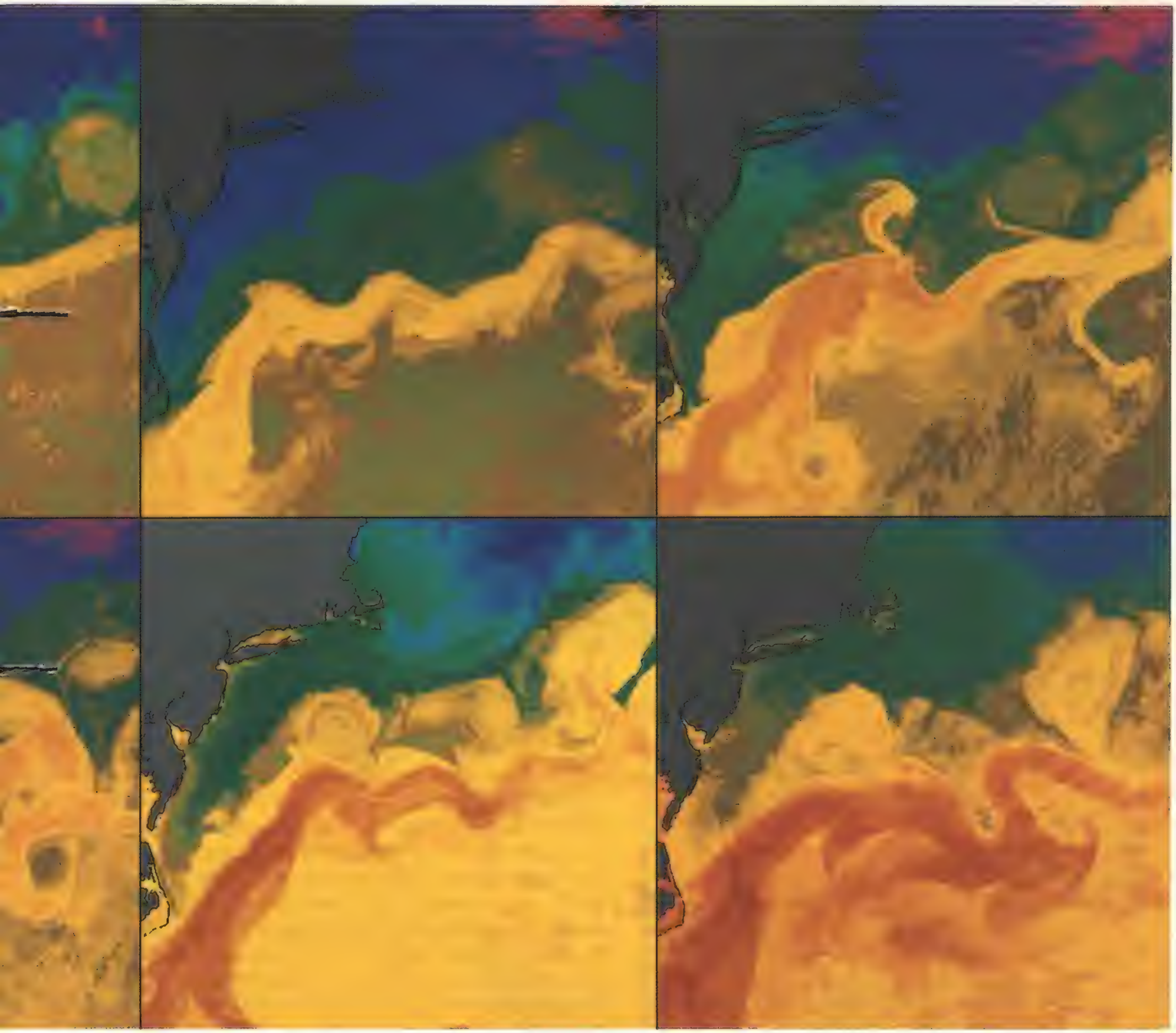


Satellite image of sea's surface temperature from 600 miles up portrays the Stream as hot, red dragon (about 80 degrees F) slowly cooling to yellow, green, blue, purple (about 40 degrees F) as it moves northeast.

By William H. MacLeish

Painting a portrait of the Stream from miles above—and below



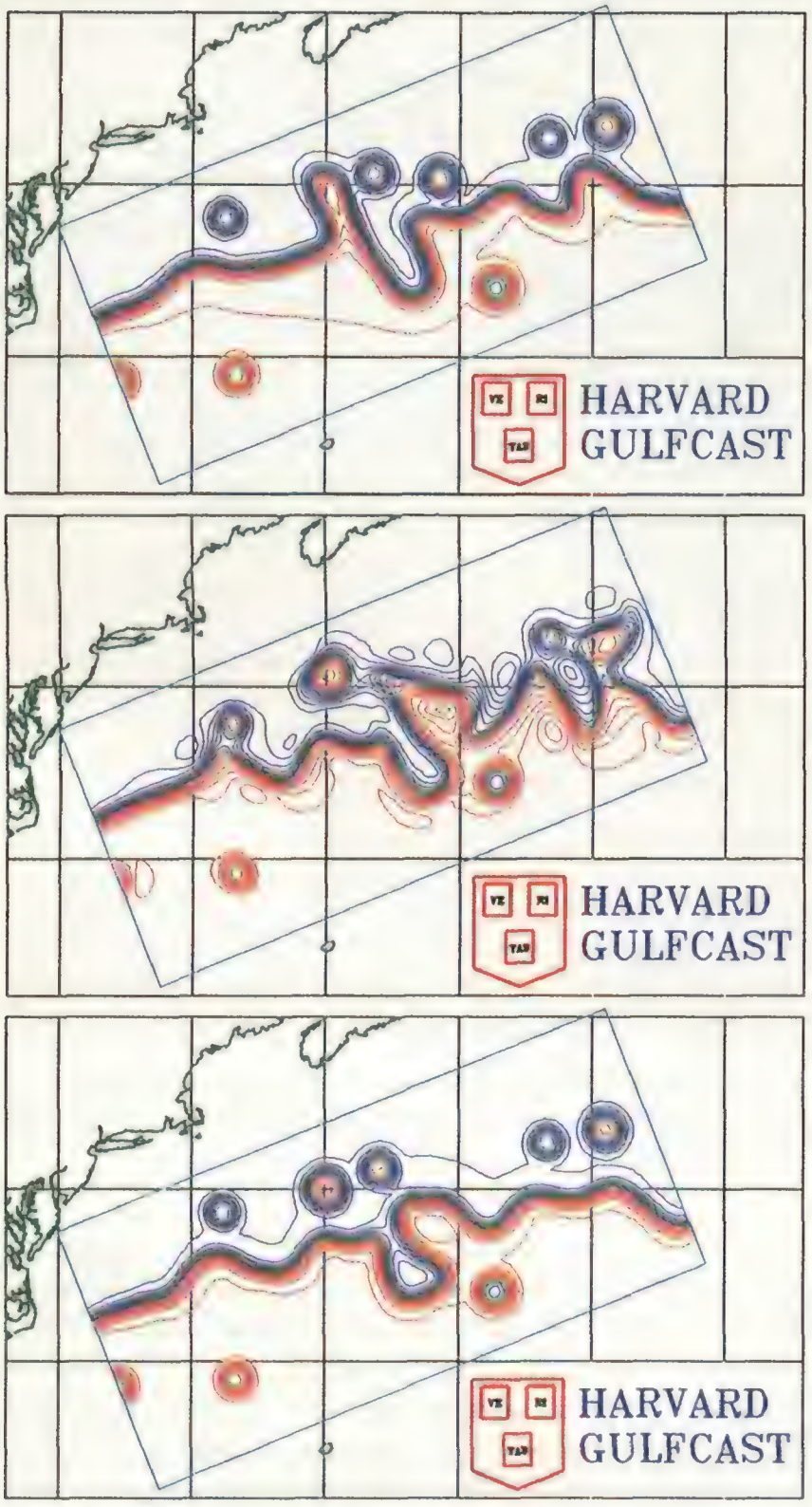
Six images above reveal Stream's meandering course in yellow, March through June, as it gradually warms and loses its sharp definition. To the Stream's north lie cold, inshore waters, to its south the Sargasso Sea.

From subs, satellites and search vessels, with glass tubes and sonar, scientists are at last getting an in-depth likeness

When they sing "From the redwood forest to the Gulf Stream waters," Americans tend to have only a small part of the Gulf Stream system in mind. That is the cobalt current that races past the Florida Keys and Miami and up past Lauderdale; the current whose spectacular color and velocity, as well as the warmth of its water, have made it celebrated throughout the world.

But after three years of working on a book about the Stream, when the time came to begin my last stint of

Second of a two-part series



Technology now can foretell Stream's progress. Top is Stream on May 4, 1988; middle predicts course a week ahead; bottom shows actual current on May 11.

voyaging I went to the other end of the line. The port of departure was the small city of St. John in the province of New Brunswick, Canada, where I went to board a roll-on, roll-off container ship built in South Korea and bound, ultimately, for her home port of Tonsberg, Norway. She was the 850-foot *Barber Tampa*, and I would ride her for a week, a good part of the way on currents associated with the Stream, to a container facility just down the Thames from London. From there, I would fly to Ireland for a look at some plants that grow where, climatically speaking, they should not be growing.

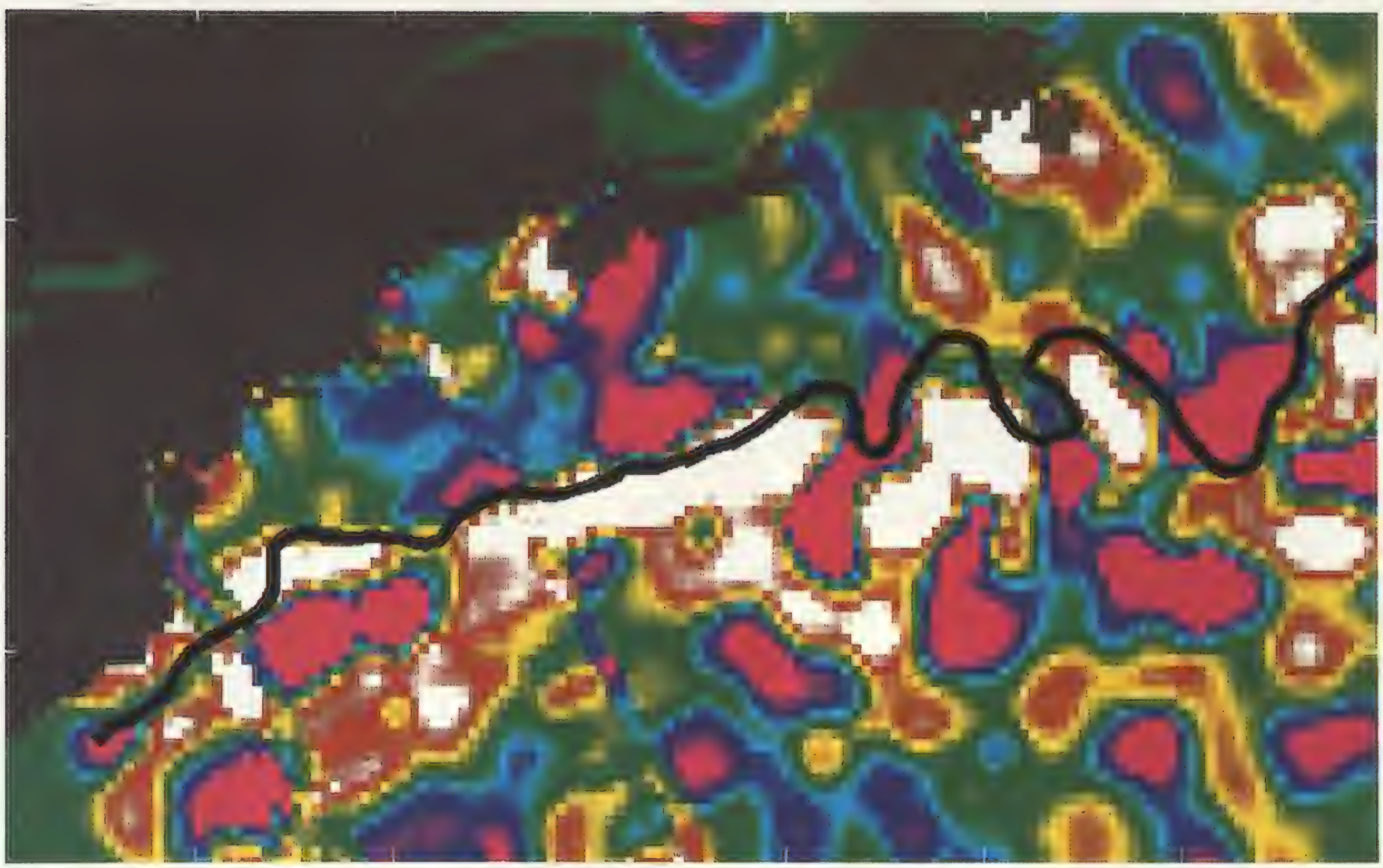
I had already sailed around most of the oceanic ellipse that oceanographers refer to as the North Atlantic subtropical gyre (SMITHSONIAN, February 1989). This trip would close the circle. More important, it would take me across some of the most fascinating and most complex ocean water in the world—whose flows and interactions affect weather in Europe and climate everywhere around a globe that today faces the possibility of severe climatic change.

"Sea smoke" and blankets of fog

With the help of a briefcase full of books, my aim was to review what answers sea science has provided to basic questions about the Gulf Stream system: Where does it go? What does it do along the way? What becomes of it? Above all, what makes it move? The work was soon so absorbing that I scarcely noticed when the *Barber Tampa* quit the harbor and slid out into the Bay of Fundy.

We rounded the southern tip of Nova Scotia, heading toward a sort of Grand Central Station of the sea. This is the eastward edge of the Grand Banks shallows, which thrust hundreds of miles out toward Europe. There the Gulf Stream comes in on a bow bend from the west, while the North Atlantic Current, cloaked in a broad wind drift, moves off to the east and northeast. And the Labrador Current runs down from the north. Depending on the season, waters off the Banks present dramatic changes of temperature—sometimes a variation of more than 40 degrees F. Even this far north, the Gulf Stream still retains some of the heat from the sun-warmed tropics, running in its near-surface layers to around 55 degrees F. But up here heat loss from the Stream is enormous, producing eerie tendrils of "sea smoke" and blankets of fog.

The Labrador Current produces something else, something more palpable: icebergs, brought down from the Greenland glaciers. Some of the bergs drift far south, to melt in the arriving Stream, threatening traffic in the busy sea lanes that the *Barber Tampa* would follow. A few months before I boarded her, I flew with the International Ice Patrol, operated by the



Crazy quilt of color shows a range of variations in height of sea's surface, as much as three feet, between white (highest) and purple (lowest). Northern edge of Stream (below black line) is consistently high.

U.S. Coast Guard. The patrol charts bergs, warning ships of dangerous intrusions. We spotted several bergs, some of them sheathed in fog. One such berg sank the *Titanic* in 1912, creating a furor that in turn created the International Patrol.

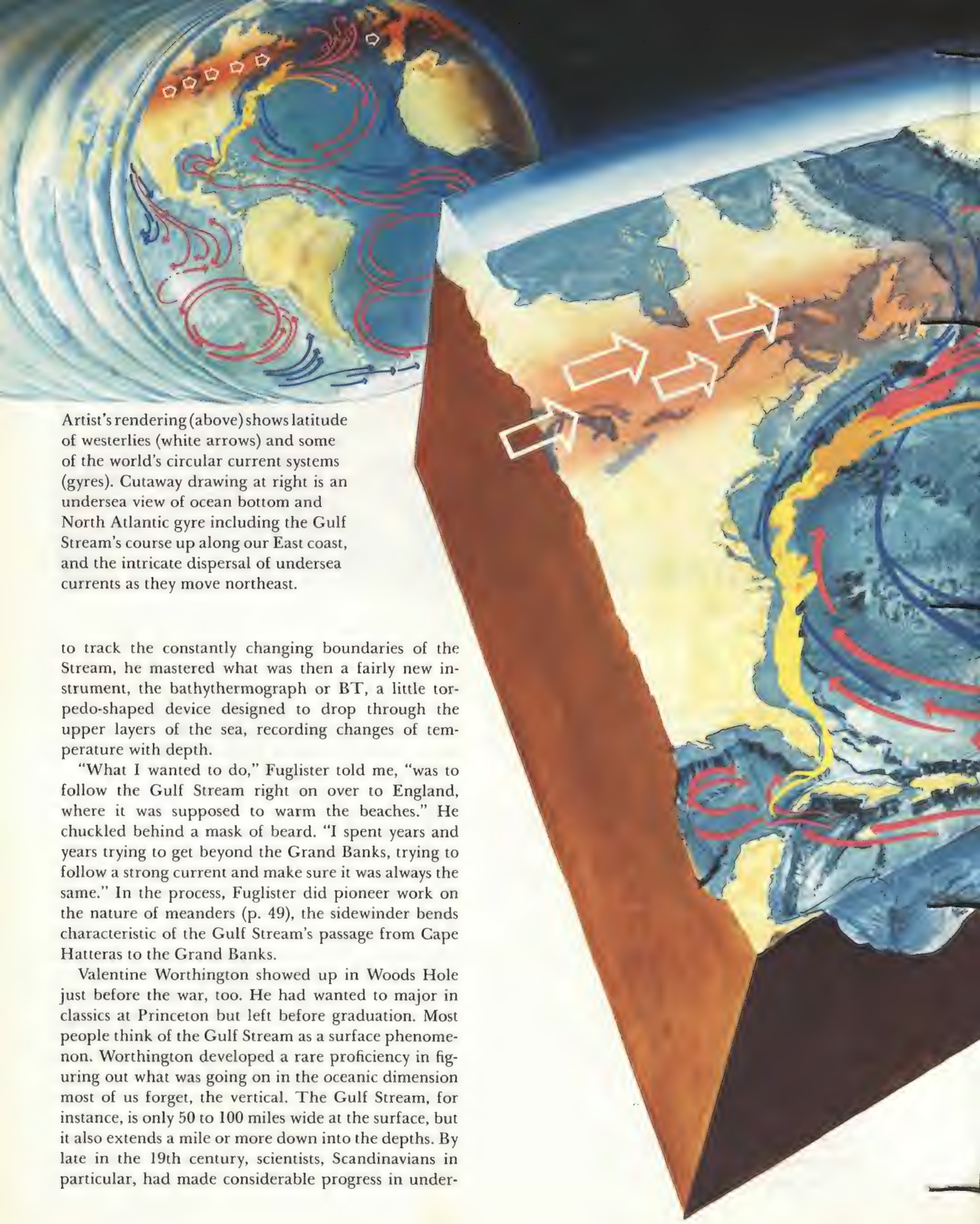
The *Barber Tampa* forged along, making 19 knots or so. She was the next thing to a ghost ship. Eighteen men ran her, a handful per watch. There was always someone on the cavernous bridge, but electronics kept an eye on much of the rest of her. Solitude even pervaded the mess, where officers and men ate excellent food to the slow, deep murmuration of Norwegian vowels. I gained weight, slept and worked on my research.

It wasn't long before we began running out of Gulf Stream, and I was confronted by a primary but long-standing popular misconception about it—the belief that the Stream itself continues on the surface to Ireland, southwestern England and Brittany, directly warming their shores. Though the Gulf Stream is one of the most thoroughly investigated ocean currents, it wasn't until fairly recently that oceanographers realized it dissipates rapidly in the Atlantic. In fact, it is not the current itself but in large measure the westerly winds now helping push the *Barber Tampa* toward England that carry the last of the Stream's warmth to Western Europe.

Benjamin Franklin took an interest in the Stream before the American Revolution. A century later, the British ship *Challenger* visited it on what historians regard as the inaugural research cruise of modern oceanography. Real persistence in the work didn't develop until the decade before World War II, when scientists out of the young oceanographic institution at Woods Hole, Massachusetts, began crisscrossing the Stream in the big ketch *Atlantis.* Three pioneering researchers come first to mind: Frederick (Fritz) Fuglister, who tried to establish the boundaries of the current; Valentine Worthington, who tried to trace the movement of water masses within the current; and Henry Stommel, a man with a rare ability to use the laws of global physics and a submarine imagination to understand the processes of sea motion.

Fuglister was a painter, a muralist, who signed on at Woods Hole in 1940 for a few weeks at sea. Trying

Adapting from his new book, The Gulf Stream, *the author tells of conversations with oceanographers, and his voyage across the North Atlantic to Ireland.*



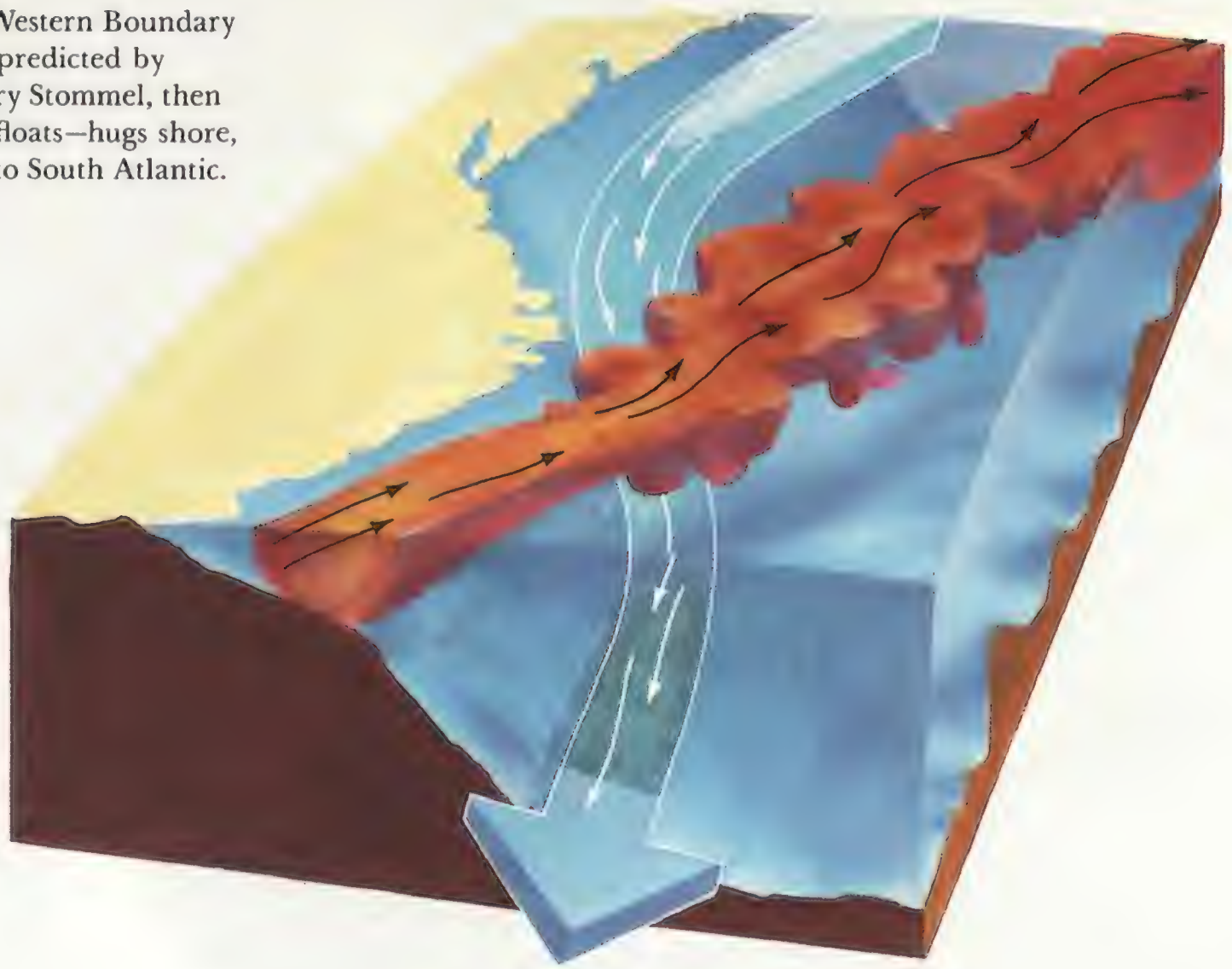
Artist's rendering (above) shows latitude of westerlies (white arrows) and some of the world's circular current systems (gyres). Cutaway drawing at right is an undersea view of ocean bottom and North Atlantic gyre including the Gulf Stream's course up along our East coast, and the intricate dispersal of undersea currents as they move northeast.

to track the constantly changing boundaries of the Stream, he mastered what was then a fairly new instrument, the bathythermograph or BT, a little torpedo-shaped device designed to drop through the upper layers of the sea, recording changes of temperature with depth.

"What I wanted to do," Fuglister told me, "was to follow the Gulf Stream right on over to England, where it was supposed to warm the beaches." He chuckled behind a mask of beard. "I spent years and years trying to get beyond the Grand Banks, trying to follow a strong current and make sure it was always the same." In the process, Fuglister did pioneer work on the nature of meanders (p. 49), the sidewinder bends characteristic of the Gulf Stream's passage from Cape Hatteras to the Grand Banks.

Valentine Worthington showed up in Woods Hole just before the war, too. He had wanted to major in classics at Princeton but left before graduation. Most people think of the Gulf Stream as a surface phenomenon. Worthington developed a rare proficiency in figuring out what was going on in the oceanic dimension most of us forget, the vertical. The Gulf Stream, for instance, is only 50 to 100 miles wide at the surface, but it also extends a mile or more down into the depths. By late in the 19th century, scientists, Scandinavians in particular, had made considerable progress in under-

Devices to help oceanographers plumb the depths include, from the left, original Nansen bottle for trapping water samples and for tracking temperatures; the RAFOS float, for tracking subsurface water movement; and the echo sounder, which can sit on the ocean's floor and transmit data. Research ship is deploying equipment.



The deep-running Western Boundary Undercurrent—first predicted by oceanographer Henry Stommel, then proved by tracking floats—hugs shore, flows under Stream to South Atlantic.

standing the dynamics of water movement below the surface. The flows there, they found, were affected by small changes in density that result in water pressure variations. Density is determined by measuring temperature and salinity of seawater; the scientists took these measurements at selected depths.

This was done by an instrument, versions of which are still very much in use, called the Nansen bottle. A number of these bottles are clamped at intervals onto a wire and lowered by winch hundreds, sometimes thousands, of feet into the sea. They are then tripped by a weight sent down the wire so that each captures a sample of seawater and records with special thermometers the temperature at its particular depth.

Working with the bottles, or a full array of hydrocasts, as they are now called, Worthington analyzed temperature and salinity, as well as oxygen content of seawater all over the western North Atlantic. Like other physical oceanographers, Worthington was attempting to map out ocean density patterns in order to determine the patterns of underwater circulation. He wanted to study how—given characteristic temperatures or chemical constitutions—moving water masses are formed in different parts and at different depths of the ocean. Such water masses retain identifying characteristics over long periods. It is possible to trace the warm, salty outflow from the Mediterranean as it moves under the surface and travels right across the Atlantic.

Early in his career, Worthington worked for Fritz Fuglister, who enlisted him in his dream of following the Stream to Europe. Worthington told me recently that he had a certain difficulty with the project. He tried, but found "the Gulf Stream doesn't go to Europe." That was a reference to Worthington's own highly controversial hypothesis, which is that the Stream's circulation is limited to a fairly tight gyre in the northwestern quadrant of the North Atlantic. He had tracked the oxygen content of the flows that did move east toward Europe from the Grand Banks area and found it higher than that of the Gulf Stream proper. Therefore, he hypothesized, the North Atlantic Current, which reached Western Europe, came from a different source than the Stream.

Fuglister and Worthington established an organization to celebrate their lack of advanced formal education, the Society of Semiprofessional Oceanographers. Another select member they recruited was Henry Stommel, who came to Woods Hole from Yale just as World War II began. Trained in astronomy, Stommel proved to have an innate sense of submarine physics and an uncanny ability to hunt down, or conjure up, convincing explanations of things that went on deep

underwater. And that was what interested him most, the physical processes of the ocean. Descriptive oceanography, the order of the day when he first arrived at Woods Hole and still emphasized now, was all very well—you had to know what the currents and eddies were doing. But what drew Stommel most was the mysterious *how* of undersea motion.

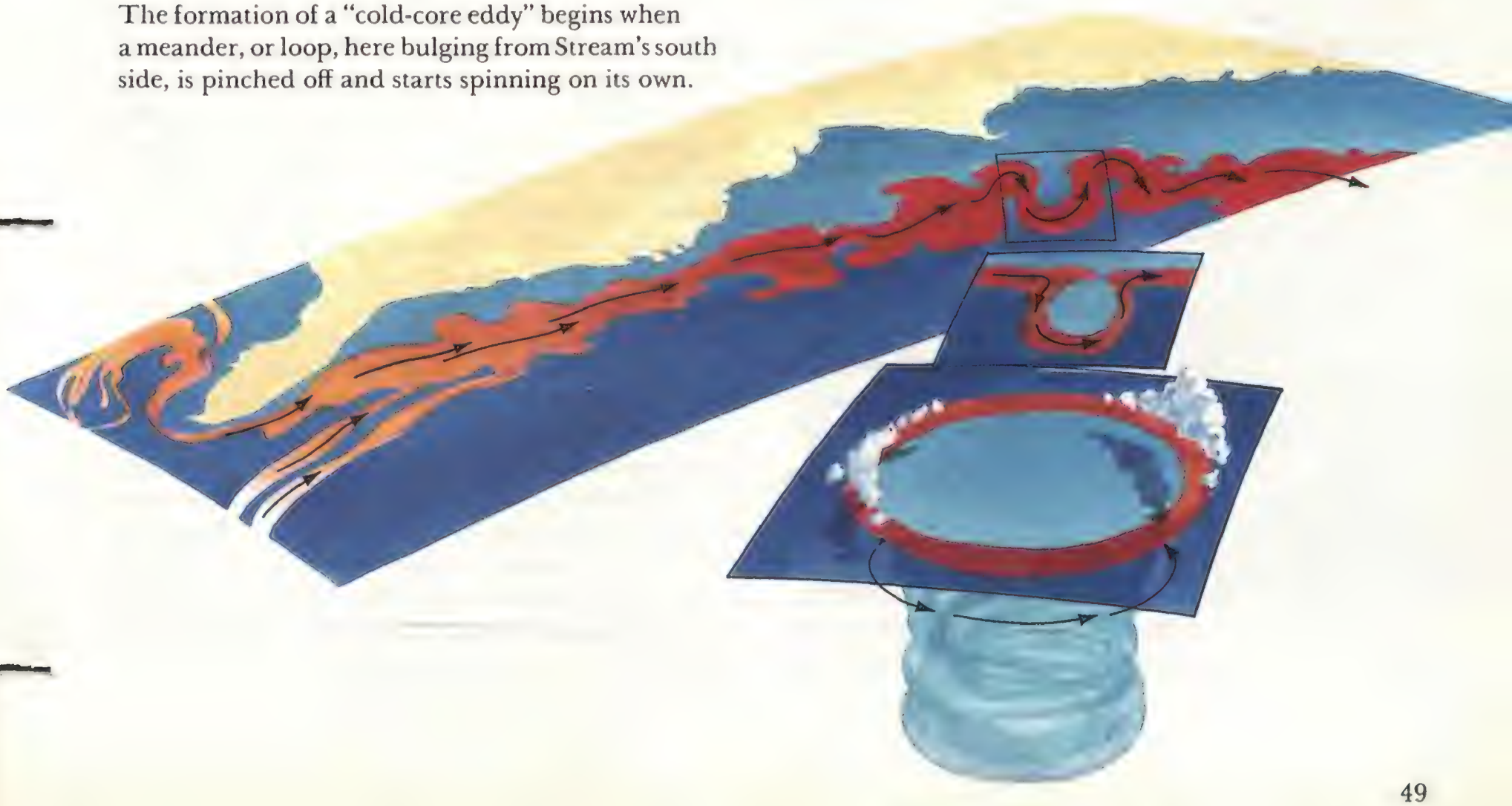
The how is complex. One major factor is density. Warm water is less dense than cold water. Like the heating system in your home, in which warm water rises from the furnace in the basement to heat the radiator in your bedroom, the warm waters of tropical regions tend to spread northward toward the pole. At the same time, cold, dense, northern waters sink and move southward; the process sets the seas in motion. Then comes the influence of the rotation of the Earth, known as the Coriolis effect (SMITHSONIAN, February 1983), which in the Northern Hemisphere acts on moving objects to impart a kind of right-hand English to vast bodies of water, causing them to move in a clockwise direction. This clockwise movement is heavily reinforced by winds—the trades blowing from the east in lower latitudes, the westerlies to the north.

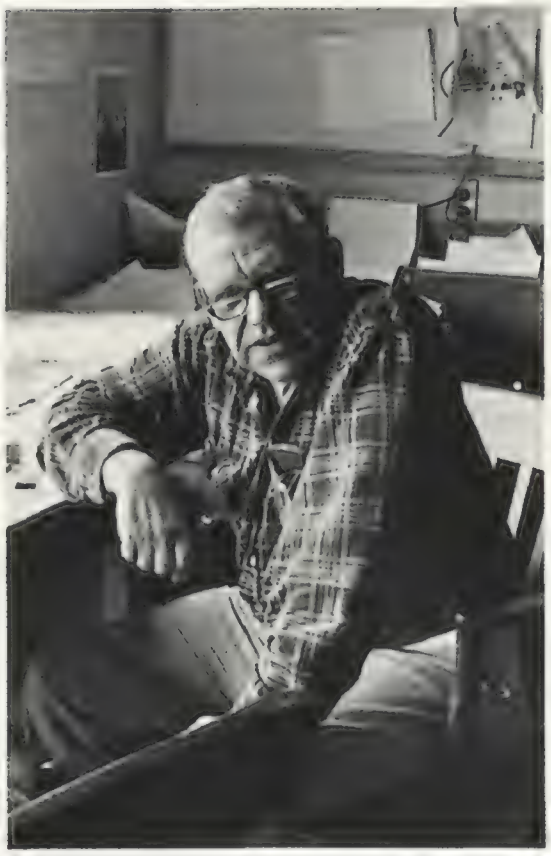
Thus the gyre—a huge clockwise rotation of the North Atlantic. Henry Stommel developed a simplified model of an Atlantic, complete with simplified continents, and clockwise circulation driven by simulations representing the trade winds and the westerlies. The simulated gyre his model produced was symmetrical—a circular current that flowed with constant force around a relatively calm center. But then Stommel cranked in another factor: the twisting effect produced by the Earth's rotation grows more pronounced as water moves away from the tropics toward the poles, and less pronounced as it circles back toward the Equator. When Stommel introduced this new ingredient into his experiment, he found that it changed things drastically. It produced a crunching of flow lines against the ocean's western boundary, which in turn produced an intensified, fast-flowing boundary current. Stommel had created a Gulf Stream in his laboratory.

What goes north in the sea must eventually return south—to conserve mass as well as to keep Europe from drowning. There was evidence that surface water moving north eventually cools sufficiently to sink. What Stommel also did was to figure out an important part of the return mechanism once the sinking (and cooling) water reaches great depth. Working with a rotating water tank model of the ocean, he posited the existence of a narrow undercurrent, perhaps rising in waters around Norway, that roughly ran through deep waters off Iceland, around the tip of Greenland and then south down the North American continent, hugging the continental slope (opposite). At Hatteras, he thought, it must simply pass under the Gulf Stream and continue into the South Atlantic, eventually flowing eastward into the Indian and Pacific oceans.

In 1957, just before his book on the Gulf Stream was to be published, Stommel received wonderful word. Worthington and another old friend, British oceanographer John Swallow, inventor of a metal tubular device that could be made to float with the current at

The formation of a "cold-core eddy" begins when a meander, or loop, here bulging from Stream's south side, is pinched off and starts spinning on its own.





Celebrated scholars in depth: Valentine Worthington, holding water sample; Henry Stommel in his Woods Hole office; and Frederick Fuglister, at a research chart.

desired depths, had produced evidence that Stommel was right. Deploying some of Swallow's floats at considerable depth off the coast of South Carolina, they had found the devices were carried away toward the south at up to a third of a knot—many times the speed thought to be typical of abyssal water movement at the time. The existence of Stommel's proposed deep-running undercurrent, which we now call the Western Boundary Undercurrent, had been confirmed.

Doing science in the ocean depths is like painting the portrait of someone you've never seen. The sea is alien to us. We can live along its edges and visit its surface. At great cost and some risk we can spend a little time in its depths. But when it comes to taking the full measure of the sea, oceanographers of Stommel's early and middle career were severely constrained. Pressures up to a thousand times those experienced on land regularly crushed their instruments. Fish bit through lines connecting undersea instruments to the surface, and some attacked research submersibles. Communication between instruments or from instruments to ship or shore was next to impossible, since the ocean is all but opaque to the radio waves that so facilitate research experiments conducted in air.

Ships are still the center of the oceanographic universe, the research vessels designed to take a scientific party where it wants to go, maintain them there for weeks, and return them and their precious data safely to the dock. The modern oceanographic ship is crammed with computers and sensors and communications devices. She can find just about anything her scientists want to have a look at, and she can hold position within a few meters of dead center.

The ship is still basically a platform for instruments, many of them products of the recent revolution in electronics and miniaturization. One is an inverted echo sounder, which sits on the bottom, well below the rush of the current, through which it sends sound pulses, timing the echo's return. As anyone knows who has watched World War II submarine films, sound travels exceptionally well under the sea. Since changes in density affect the speed at which sound travels, instruments like the echo sounder can monitor the structure and movement of currents within the Gulf Stream. Researchers at the University of Rhode Island's Graduate School of Oceanography, one of the leaders in Gulf Stream research, use it to track thermal fronts in the current and spy on its patterns of behavior.

Thomas Rossby, a scientist at Rhode Island, has developed a small drifter—a Pyrex tube enclosing jewels of electronics—known as the RAFOS float. It is a descendant of the devices John Swallow used to find Henry Stommel's undercurrent, devices that are known as SOFAR floats (for Sound Fixing and Ranging). SOFARs drift through the sea, cricketing their whereabouts to distant listening devices. Rossby's tubes do the opposite, recording pings from an array of sonic sources and then surfacing to broadcast their data to a

communications satellite. RAFOS is SOFAR backward.

The RAFOS floats, set to follow a selected density layer in the ocean, have helped Rossby's group determine that the Stream changes character with depth. Near the surface, it has a relatively smooth flow. Floats tend to stay in the current for some time, often a month or more. Deeper down, things get more chaotic; there is considerable mixing with adjacent waters, and the floats are more apt to be ejected from the main flow.

These days, too, satellites far above the sea's surface carry sensors that are giving marine science a breadth of vision, a mobility, it never had before. Research vessels and the hardware they deploy are enormously limited in range; by the time a vessel completes a transect of the North Atlantic, the ocean at her point of departure is markedly different than it was weeks ago when she measured it. A satellite, orbiting Earth several times a day, sees the ocean synoptically—taking in huge expanses in an instant.

Basically, two kinds of information descend from on high. The first has to do with the topography of the sea surface. Winds, the Earth's rotational forces, even a heavy rainstorm at sea can produce local differences in sea-surface height. Satellite altimeters now measure the highs and lows of the ocean surface so accurately that oceanographers can map pressure fields somewhat as weathermen do. The simile is apt. Air and water are both fluids, and the dynamics that control them are comparable—the chief difference being that the ocean is about 800 times denser than air.

Satellites also read heat and cold at the sea's surface, or rather the infrared emissions that betray sea-surface temperature. Their readings feed computers that turn numbers into colors. Represented by computer graphics (pp. 42-43), the Gulf Stream becomes a Chinese dragon off our East coast, flaming at the warm core of the current, cooling into blues and magentas at the margins. It stands revealed as a whole, from the race of the Florida Current to the confusions off the Grand Banks. You can make out warm-core rings (Sargasso Sea water surrounded by a loop of Stream water, over the continental slope) and cold-core rings (slope water bounded by a circling of Stream water in the Sargasso).

From Miami, a "temperature" movie

Computers and supercomputers are now able to add motion to such pictures. A team at the University of Miami has created a movie that shows steady changes in sea-surface temperature. At the University of Rhode Island, satellite data on the Stream have been transmuted into a film that shows how eddies move, drifting back upstream, recoalescing with the mother current or blocking a meander, forcing it to stall and balloon.

More important, the satellite-computer marriage has given marine scientists the wherewithal to call up oceans on their monitors and predict the behavior of currents. Allan Robinson of Harvard University is just such a marine forecaster. His "weather," which consists of the fronts, meanders and eddies of the Stream, moves through far more slowly than do atmospheric disturbances, taking weeks to cover the distance a winter low would travel in a few days. But Robinson's group also spends time looking at currents and eddies—the small, slow and immensely powerful underwater storms that contain so much of the ocean's energy. Robinson has had plenty of critics, who have claimed that he hadn't pushed his predictions far enough into the future to demonstrate success. So far the Harvard process—Robinson actually calls it Gulfcasting—has proved capable of predicting highly unusual events like the birth of a double Gulf Stream ring, and its accuracy now holds up for several weeks.

For any science, the essential payoff of research is expanded knowledge. But there are more pragmatic benefits. The U.S. Navy funds a significant part of marine research in this country, not out of altruism but because physical oceanography is now of basic importance to naval strategists the world over. One reason is that the submarine has become one of the most powerful weapons of war, and nations with the wherewithal to make their subs faster, deeper diving and quieter, regularly do so. Sound is still the best hunter of these lethal lozenges, sonar that pings off the metal hulls or hydrophones that can pick up the slightest creak of

Undersea hazards include hostile natives like this swordfish that attacked the "eye" of submarine *Alvin*.

machinery. But, as we have seen, sudden changes in temperature and density can do odd things to sound rays, bending them, creating shadow areas where submarines can hide. A Gulf Stream eddy thus makes a nifty hidey-hole, and it behooves the submariner serving any power to know how to track it and other oceanic fronts.

Commerce also benefits from undersea information. Food fish in abundance are found near the edges of warm and cold rings. Offshore oil drillers in deep water need to track eddies that could run into their rigs, possibly damaging delicate drill strings. Environmental officials cannot estimate how pollutants disperse in the sea without clear knowledge of the flows that make up its circulation.

Today the demand for information is strong enough so that the National Oceanic and Atmospheric Administration produces a five-day-a-week chart of Gulf Stream activity, including advance warning of bad weather to come. The producer, an oceanographer named Jenifer Clark who is based in Camp Springs, Maryland, relies on satellite information and her own extraordinary knowledge of the Stream's habits. She also works closely with yachtsmen who keep records at sea, to help increase her accuracy. The "Gulf Stream Daily" is accurate enough to attract subscribers ranging from various oceanographers to big-game fishermen to Coast Guard search-and-rescue teams.

The *Barber Tampa* was now well along on her way to London. We steamed a bit south of the great circle route, taking advantage of both wind (the westerlies) and weather. Up on the bridge, the captain, Ole Abrahamsen, talked about how the Norwegian Current, an extension of the North Atlantic Current, gentled the winters of his island home near Oslo. I remembered that current. It loops over the top of Scandinavia and east toward the Soviet Union, where it is credited with keeping ports like Murmansk ice-free when harbors far to the south freeze over.

Research vessel *Atlantis II* begins to haul deep-sea explorer *Alvin* and her crew safely back aboard.

The notion that the Gulf Stream acts as Europe's furnace is still part of the public's collective unconscious. At Woods Hole, they tell the story of a perfume manufacturer who approached the oceanographers with a request: he wanted to promote his product by dumping a tankerload of it in the Stream off Miami. His aim was to have it in the nostrils of the British by Easter, and he wanted to know how far ahead to cast his scent upon the waters.

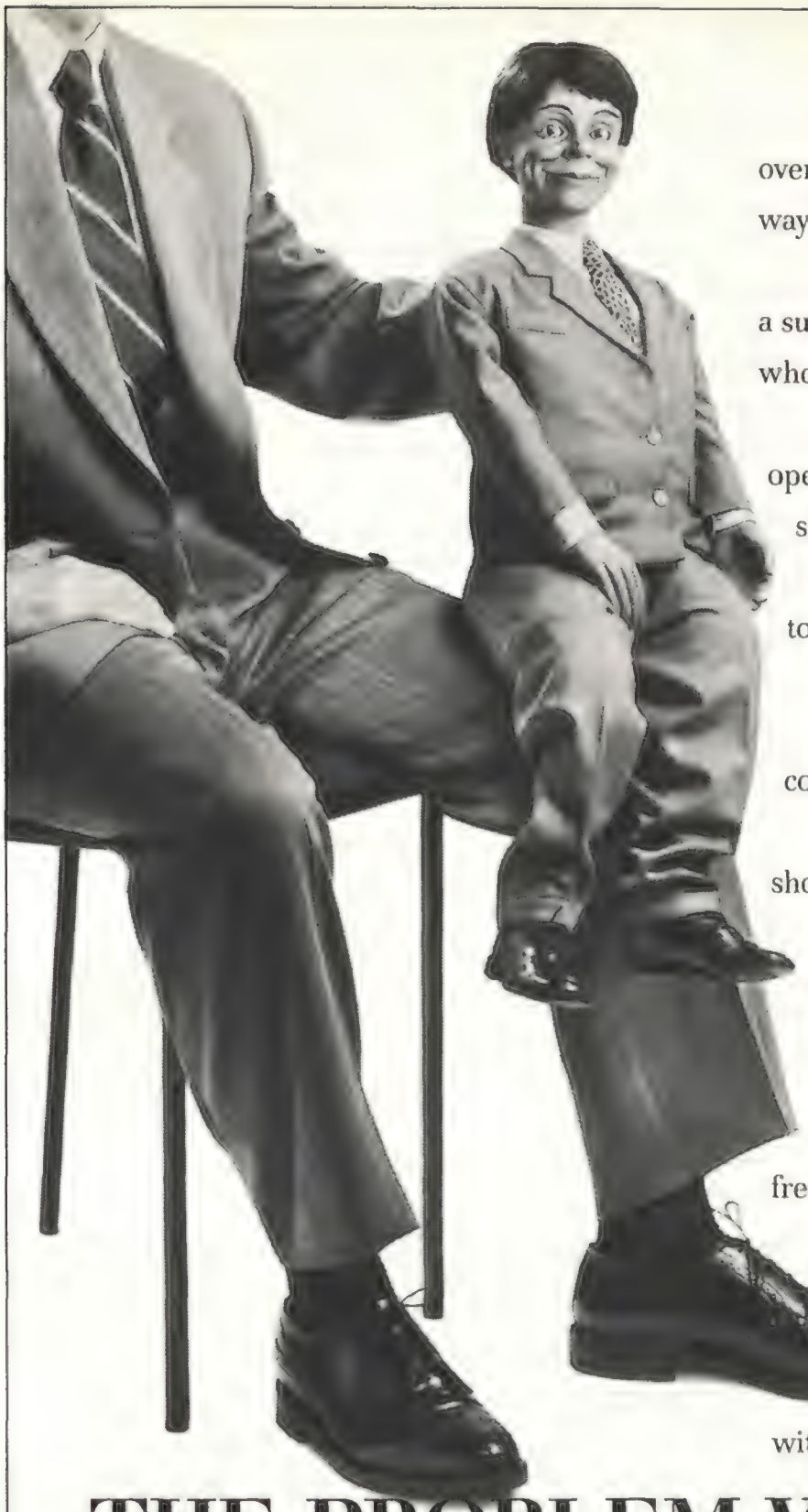
Not all a gift of the Gulf Stream

It is pretty clear that some warm water from off Newfoundland flows east toward Europe. Some oceanographers estimate the flow as approximately that of the Florida Current—substantial of itself but, especially after dispersal into distributaries, hardly enough to do much more than warm up a stretch or two of coast. But it would be a mistake to say that all warm water in the northern sea is a gift of the Gulf Stream. Circulation in the eastern North Atlantic is a maze of cross-flows. And there is also evidence of warm currents working their way north along the coasts of Europe.

The real answers to the Gulf Stream-as-furnace notion are blowing in the wind. If there were no North Atlantic, if Europe and North America were one landmass, frigid winds blowing out of the North and across Canada would arrive in Western Europe pretty much unchanged, and winters in London and Paris would be cold indeed. Several thousand miles of intervening seawater make a great difference, warming the winds and moistening them, too. That heat and moisture create what is called a maritime climate over much of Western Europe.

The Gulf Stream adds to the equation, hauling tropic water north to fuel the westerlies with even more heat and moisture. That fueling, evident in sea smoke and fog, represents a tremendous transfer of energy, the equivalent of a network of power utilities bobbing and humming across the seas far off Newfoundland. The transfer varies a good deal and that variation is translated into different yearly weather patterns over Europe. A British meteorological team has found that when surface temperature off the Grand Banks is abnormally high in winter, so is rainfall over northern Britain.

I had brought aboard a copy of Henry Stommel's latest book, *A View of the Sea*, an attempt to place



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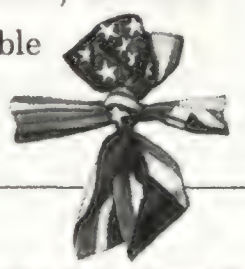

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Palms flourish on the Irish coast, but Gulf Stream does not—as was long believed—touch its shores.

theories of modern physical oceanography within the grasp of the technically-minded layman. I read it, remembering a talk with Stommel on a hot afternoon under evergreens bordering his place outside Woods Hole. He was describing his recent construct of vertical circulation, shallow and deep, in the North Atlantic. He asked me to think of a water parcel, say, a bathtubful, moving slowly just under the surface in the southwestern Sargasso Sea. It would move south and then west, entering the Gulf Stream for a quick ride to higher, colder latitudes. There, it would cool and sink, eventually looping around and back to the Stream at a level below its first trajectory. On its second time around, it would hitchhike even farther north, cool further, sink deeper, loop around and repeat the process.

Eventually, his theoretical bathtubful of seawater might travel so far north and east that it would enter the Norwegian or Greenland seas. There, oceanographers have found, winter winds off the polar ice chill surface water to the point where it sinks all the way to the bottom and begins a return flow south, some of it in the deep undercurrent whose existence Henry Stommel posited back in the 1950s. The newly cooled water drifts toward lower latitudes at a leisurely pace; centuries can pass before the flow begins to filter upward, warming as it goes, charged with abyssal nutrients that help support life in the near-surface layers. Then, once again, it begins its trip poleward in another cycle of what scientists call vertical circulation.

In the last ice age, which ended 100 centuries ago, the Gulf Stream was denied access to the Northern seas. The process of denial is not well understood. Perhaps the ice covering those seas was thick enough and permanent enough to insulate the water below it, slowing down the cooling and sinking process. That in turn would reduce deep flows toward the Equator, and that in turn would affect the most powerful part of the circuit—the Gulf Stream. In any event, scientists have found evidence that during phases of the Ice Age, the Gulf Stream turned sharp right at Cape Hatteras, at times flowing straight across the Atlantic to Spain.

Palms, and fuchsias ten feet tall

The *Barber Tampa* raised the Scilly Isles, swung round into the English Channel and headed up the Thames. When we berthed, I shook hands with Ole Abrahamsen and, after the most expensive taxi ride of my life, flew from Heathrow to Dublin and drove to the west of Ireland. A day later, I stood on a lane west of Galway with a friend, Charles Nelson of Ireland's National Botanical Gardens, looking at impossibilities: fuchsias ten feet tall and cabbage palms. These are subtropical plants, originally imported from Chile, New Zealand and Brazil. Yet here they were, flourishing in a land that lies north of Canada's major cities— almost as far north as Moscow. This was indeed external assistance, yet I knew enough now not to give the Gulf Stream all the credit for it.

Nelson took me onto the bog and showed me that a forest had grown there thousands of years ago, before temperatures and rainfall patterns had shifted and a blanket of peat formed, producing a quaking morass. I looked down at a darkened pine stump and thought of the climatic changes that modern scientists believe are on the way. Different changes, in that we, rather than nature, are responsible for most of them. The story is all too familiar. Automotive and factory emissions, even the gas propellants in some spray cans, have invaded the atmosphere and noticeably altered its chemical composition. The most publicized result may be global warming on a dangerous scale, as carbon dioxide and other substances come to swaddle the Earth.

Up until now, the ocean has been a balancing force, absorbing carbon dioxide from the atmosphere and carrying it to long-term storage. But like all other processes, this one too has its limits.

No one can predict what will happen or to what extent. Carl Wunsch of MIT, one of the nation's leading oceanographers, sketched two opposing scenarios for me, each involving Gulf Stream behavior. Both assume that warming will be more pronounced at the poles than at the Equator. In scenario one, polar warming decreases the temperature difference between tropics and Arctic that helps run the ocean's water-circulation pump. With the pump weakened, less warm water moves north and Europe gets cooler. In scenario two, warming in high latitudes is sufficient to produce a pool of warmish surface water. Westerlies pick up heat from the pool and Europe, as a result, gets warmer.

Wunsch believes we can't really understand or accurately predict such variances unless we work on a global scale. What happens in the Stream must affect what happens elsewhere in the world's oceans and vice versa, whether on a scale of weeks or centuries, feet or thousands of miles. Thanks to rapid advances in theory and techniques, he says, "for the first time it is feasible to think about viewing the ocean as a single connected fluid that is interacting everywhere with the other global fluid we have to deal with—the atmosphere."

Wunsch and his colleagues are planning a world-ocean circulation experiment, to be launched early in the 1990s. The aim is to advance oceanographic knowledge to the point where world-ocean models can be developed, simulations sophisticated enough to be coupled with global meteorological models. With that coupling, we finally will have painted the portrait we need to see clearly the twin fluids, ocean and atmosphere, in the spin of the Earth. We may then come to understand climate, and our role in affecting it, well enough to avert wrenching shifts in the temperature and moisture patterns of our planet.

Driving back to Galway, I kept drawing a parallel between society's outlook today and that of the man who sailed the southern arc of the Gulf Stream gyre 500 years ago. Christopher Columbus was concerned with a voyage into the unknown. So are we. He addressed himself to the discovery of a new sailing route to the Orient. We have to address ourselves to the preservation of a planet. He made basic mistakes, and had the skill and the luck to survive them. We could do far worse, I thought, than remember him in our own voyaging.

Forbidding icebergs are shrouded in fog, and often in "sea smoke," the name oceanographers give to the particular kind of foggy tendrils created when frigid air meets Gulf Stream currents in the North Atlantic.

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By Sue Hubbell

Its ponds may not always be golden, but the loon still sings a wild song

We've given this big bird a hard time, but now, thanks to Loon Rangers and some other friends, we're beginning to make amends

Once upon a time, according to an old Inuit folktale, Loon and Raven were partners but in those days both birds were white and had no coloring on their parkas. They hunted during the day, and spent many evenings together talking and joking. One day when Raven was out hunting by himself, he found a place where people had camped on the shore of a lake and left behind charred wood from their fire. Raven flew back to camp and said to Loon, "Partner, our color is white. In the summer any animal can see us easily and when you hunt fish you scare them because you are so light. We ought to do something about our parkas."

"How?" asked Loon.

"We can use charcoal," replied Raven. "And we can make all kinds of fancy trimming."

When they got to the place where the people had made a fire, Raven said, "Let me color your parka first, but you will have to shut your eyes until I finish." Then Loon took the charcoal and it was Raven's turn to close his eyes. For a long time Loon colored and then he said, "All right now, open your eyes."

Raven opened his eyes and looked but he could see no fancy trimming. "You are a damned scoundrel," he croaked angrily. "I know I should not be this black." Loon just laughed. Raven grabbed a handful of ashes and threw them at Loon, but Loon dived quickly into the lake and the ashes only struck him on the back of the neck, where you can see them to this day. And that is how Loon got his beautiful parka. He is still laughing about how he fooled Raven.

When we first became human, loons were already here and we have always told stories about them. They're the stuff of legend and of the modern equivalent—research. The common loon, *Gavia immer*, is the one many Americans and Canadians see in the summertime. (The other species are the arctic, the Pacific, the red-throated and the yellow-billed, and their ranges have less overlap with ours.) A goose-size bird, the common loon is striking in breeding plumage, smart white and black, with red eyes. Loons' eerie calls are loud enough to carry over the large territories (anywhere from 50 to 200-plus acres) that mated pairs defend on their Northern lakes.

Loons are specialists, most at home in the water where their dense bones and the ability to force air from their bodies help make them extraordinary divers. When given enough water (10 to 20 acres) a loon can run awkwardly across the surface with wings aflutter and raise its heavy body into the air, where it is a fast flyer. Radar-tracking reports tell of loons cruising at 75 miles per hour, but in short bursts they probably can get up to the speed of a big-league pitcher's fastball—90 mph or more. On land they are clumsy. Their legs, so excellent for swimming, are far back on their bodies and nearly useless for walking. When they must get out on land to mate and nest, they push themselves along on their breasts and bellies.

At one time the common loon's North American breeding range extended as far south as Pennsylvania, Illinois, Iowa and California. Today the species breeds in Canada and only the northernmost part of the United States. A smaller population breeds in Iceland and Greenland. In the fall loons migrate to spend their winters on ocean waters.

These are big, emphatic birds and we pay a lot of attention to them. When in June 1987 the last dusky seaside sparrow died, the extinction merited a news story here and there. But when bad things happen to loons, and they do, we raise a ruckus. We form loon-protection societies, write PhD theses, organize rescue missions. We think loons are special. We like loons. William Barklow, a zoologist who provided the loon-call soundtrack for the movie *On Golden Pond*, put

A portrait of vigilance, female loon surveys lake in northern Minnesota from a sheltered vantage point on rim of floating island. Her nest, a grassy platform near the water's edge, is located only a few feet away.

Heeding the call of the loon

A pair of loon eggs, thick-shelled, impressively large and olive in color, blends right in with nest and cattails.

together a recording, *Voices of the Loon*, which has sold more than 80,000 copies. We're loon groupies.

Recently, I watched with interest while members of New Hampshire's Loon Preservation Committee (LPC), a project of the state Audubon Society, gathered on the shores of Lake Winnipesaukee for their annual loon festival. In the course of a few hours, they raised $20,000 by briskly selling to one another an astonishing array of items crafted, painted, stitched and embossed with loons: everything from shirts, tote bags and eyeglass cases to wood carvings, floor mats, calendars and coloring books. Anyone who knows an LPC member must learn to steel himself as he undoes the bow on his Christmas present.

Alan Phenix, a bearded young silversmith, spread out his wares. Why, I asked him, does he put loons on jewelry? "Loons are popular now," he replied. "They're like unicorns, you know? A few years ago everything had to have a unicorn. It's like that with loons now."

Compared with loons, humans are an upstart species. We've only been around a few million years. Ancestral loons separated from their closest relatives 50 million years ago, and modern forms have been here for 10 million years. It is likely that even that long ago they yodeled, hooted, wailed and laughed as they do today. Perhaps, says loon booster Rawson Wood, that's why we all feel a tingle along our spine and grow pensive when we hear loons calling over dark waters on summer nights in places that are wild, and in places that used to be wilder. Wood is the former chairman of the North American Loon Fund (NALF), which coordinates state loon committees.

Not a nice day for the loon count

On the day of Maine's annual loon survey in mid-July, I traveled North to stay there with a friend from New York City, who has a camp on a remote western lake, and help take part in the count, which must be made between 7 and 7:30 in the morning. My friend had invited several other guests, also from New York, who thought counting loons from canoes would be great fun. As it turned out, the fun index was down, owing to driving rain and high winds that morning, but everyone was a trooper, humans and loons alike. We counted four loons, an adult pair with two youngsters (who became part of a final number officially reported to be 1,139 adults and 156 chicks). One of the adults, probably the male, treated us to a fine display of defense by rising almost on his tail and holding himself in place by beating his wings. We deferred to his threats, paddled ashore and went to a dry inn to have a hot breakfast, congratulating ourselves for having seen such a good bit of loon behavior on a day so wretched by human standards.

Alarmed while sitting on nest, loon hunkers down to reduce visibility, and thrusts head toward water in case a quick escape is necessary. When forced to leave, a bird often attempts to distract predator from eggs.

But the loons had something even better in store for us. That evening we were sitting on the deck of my friend's cabin, overlooking the lake. Only a few other cabins are on that lake and they're clustered up at the far end. The previous night we had sat out there inhaling the good fragrance of the Maine woods, watching the stars, and listening to loons on our lake and on the ones nearby. The chorus had been started, as is usual, by a single loon with a two-tone wail. Gradually others had joined and we took it all in, thinking the long thoughts loon music always starts inside human heads.

Now, as we waited expectantly, the silence of the lake was broken again, but this time not by the birds. *Ah-WHOOP!* shrieked a burglar alarm from the direction of the cabins. *Ah-WHOOP!* it repeated.

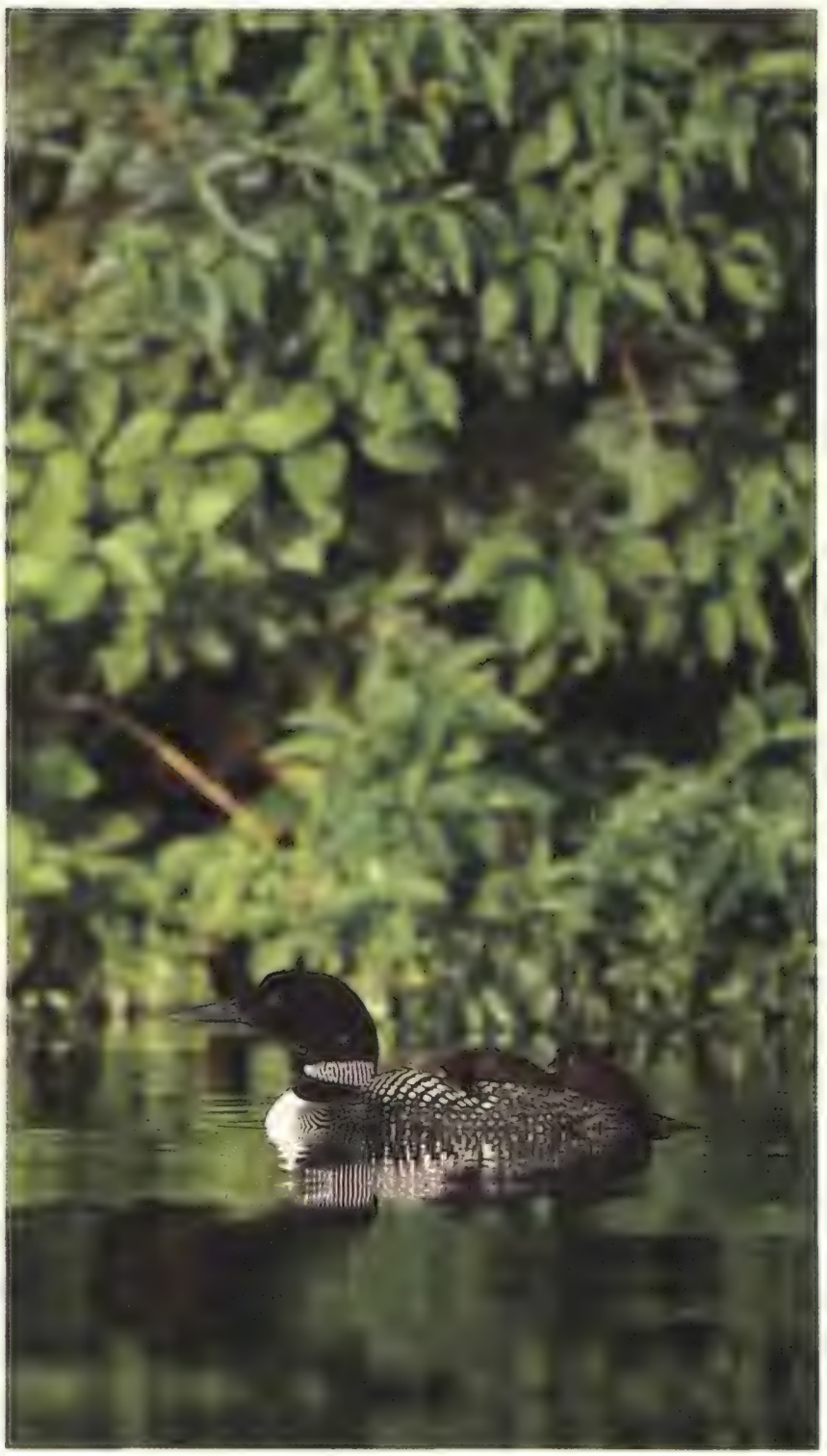
AAAAAAHWooooooooa, answered a loon, perhaps believing that the granddaddy of all loons needed an answer.

Ah-WHOOP! the burglar alarm insisted.

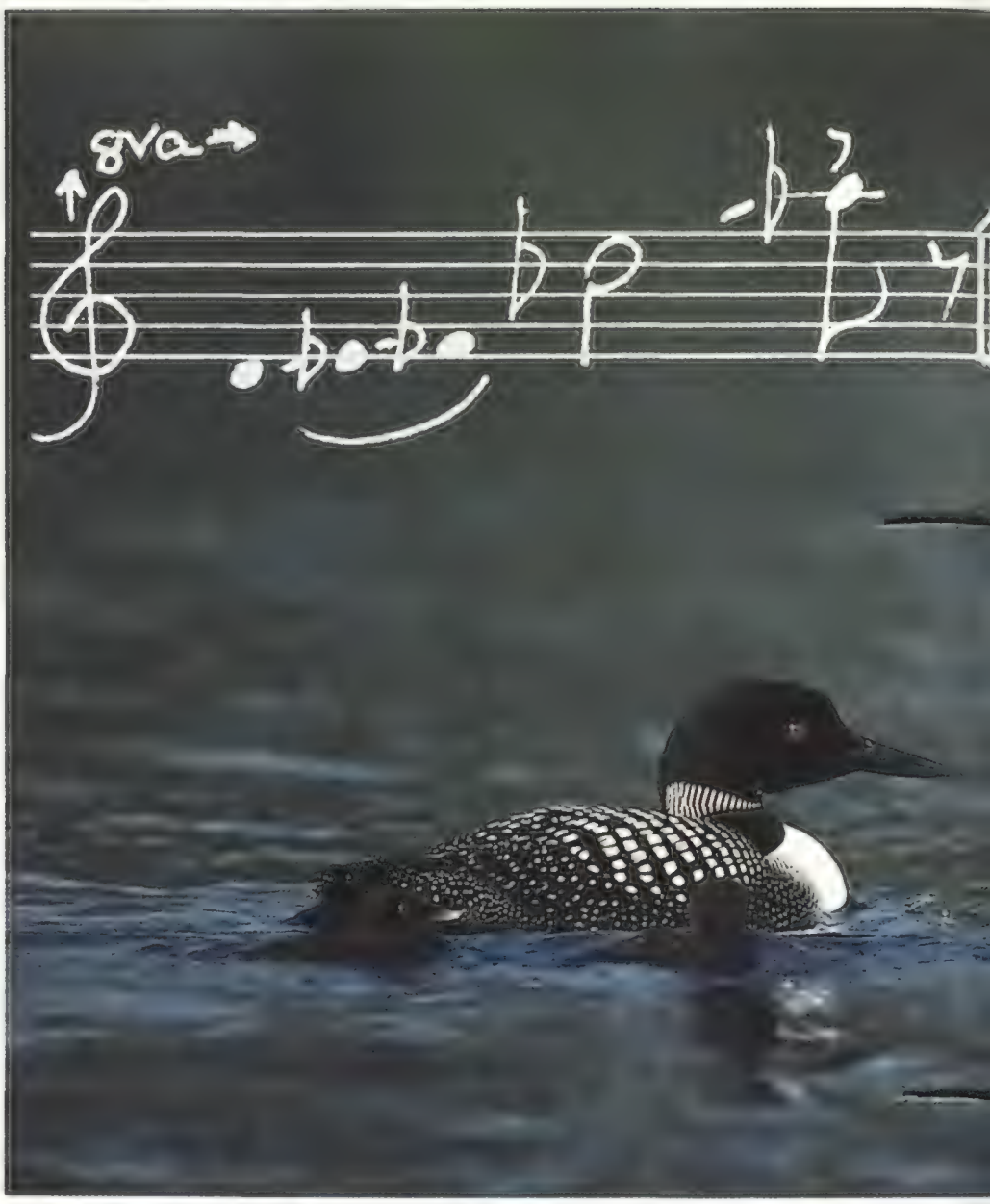
AAAAHWoo, AAAAAHWoooooa, AAAHWOOoo-oooa, replied several loons.

Ah-WHOOP! The alarm attempted no variations and did not know when to quit. Apparently the obnoxious thing was malfunctioning. More and more loons joined the chorus. Their wails changed to tremolo calls that biologists say speak of excitement. Their calls were so many and so agitated that they nearly drowned out the burglar alarm, which continued stubbornly to repeat itself.

Suddenly the loons stopped, apparently grasping that this almost meaningful noise had nothing to say to them. Eventually the alarm stopped, too, pulled out by its electrical roots, I hoped, by an angry neighbor. After a long time, the loons began their regular chorus.



Adult loon takes chicks for a ride on back. Youngsters begin turning from black to gray when 2 weeks old.

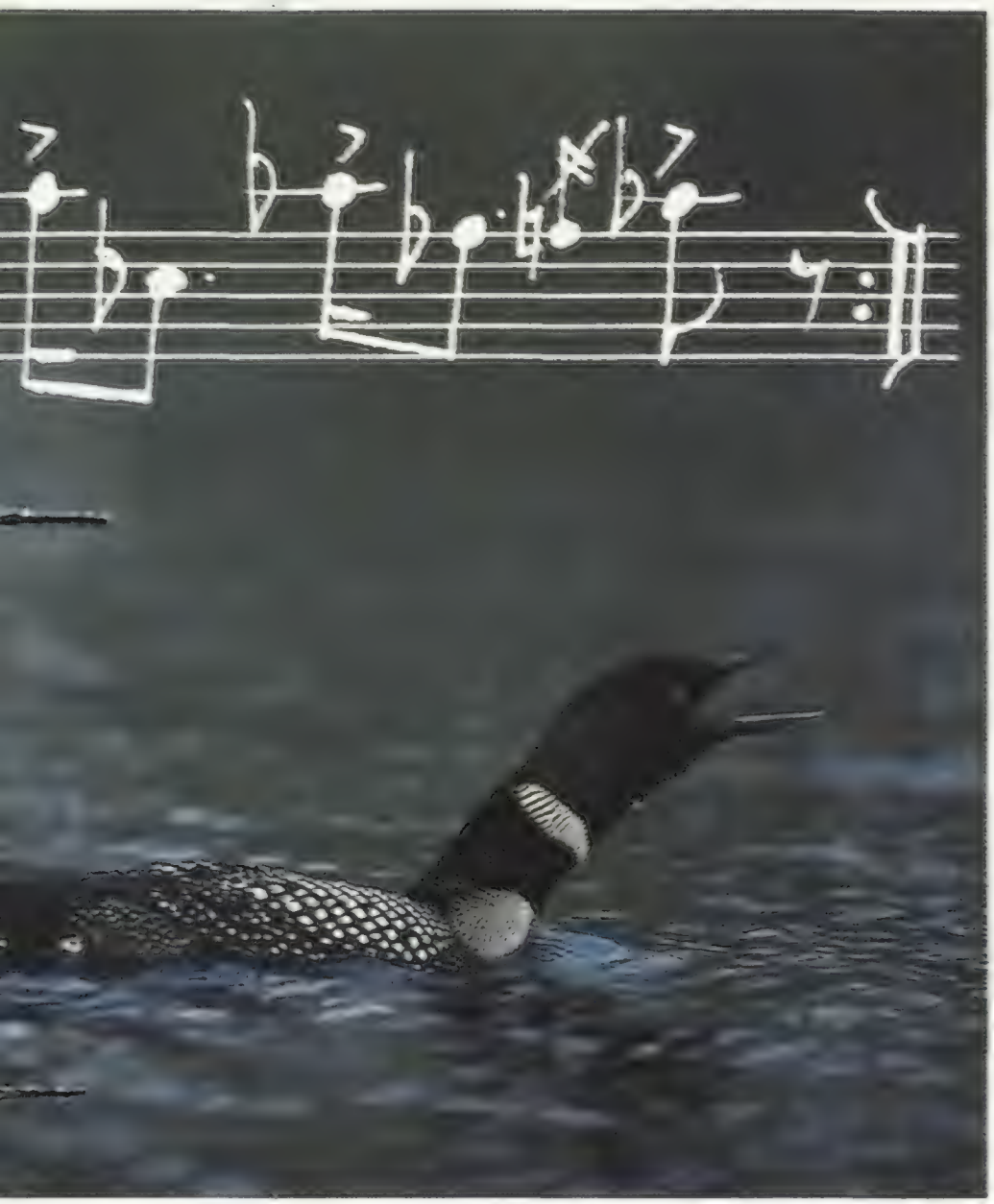
Heeding the call of the loon

Crossing a lake with mate and two chicks, parent on right issues a warning call as photographer approaches.

Loon calls can be imitated with passing accuracy—and considerable zest. A friend of mine, the head of the physics department at a major university, clasps his hands, blows through the small gap made by the curve of the joined thumbs, modulates by raising his fingers, and talks to loons on Canadian lakes when he fishes there. He learned how when he was 16 and courting a young lady who possessed this talent. He spent the entire summer sitting next to her on a porch swing, practicing the loon call. And although he did not win the young lady, he still counts the call, which he will perform at the drop of a hat, as one of his major social skills. For those of us less able, however, I understand that one can produce a fine loon call on a "sweet potato," a type of ocarina.

In recent years, loon calls have been studied by researchers and it is now generally accepted that there are at least four basic calls in a loon's vocabulary, with gradations and combinations and shading to refine the meanings. Within a family, loons call to one another with a soft hoot. The wail, the cry with which the nightly chorus commences, is used when one loon is trying to establish contact with other loons. The tremolo calls that are supposed to sound like a madman's laughter are alarm calls. (The word "loon" has nothing to do with moonstruck craziness. One story has it that it's derived from *lumme*, a Middle English word, possibly of Scandinavian origin, meaning "clumsy"; it has a closer relationship to the verb "to lumber" than it has to "lunatic." In Europe the birds are more often called "divers.") The yodel is the song of the male loon, a complex series of rising notes followed by an undulation; it is gorgeous to human ears but a loon uses it to define and defend his territory. Very recently, researchers have discovered that male loons' yodels are distinctive, each from the other, and can be used as aural tags to study and follow individuals. Loons are such swift and deep divers that it is enormously difficult to band them, so having these vocal tags to mark one from another is helpful to researchers.

William Barklow, who is affiliated with Framingham State College in Massachusetts, cautions against trying to oversimplify the meaning of loon calls. Even the relatively straightforward wail used to establish contact with other loons, he says, does not appear to contain a discrete message. "Its interpretation depends on the context in which it is given," he says. Consequently, loons receiving the wail call may react with a mixture of curiosity and confusion.

Within the territories that are established by the males when they return to freshwater lakes after wintering on the ocean, the pairs mate, nest and raise their young. It is generally believed, although not proved, that loons mate for life. (They may live for 30

Sue Hubbell, a commercial beekeeper, is the author of A Country Year *and* Book of Bees *(both from Random House), and writes often for the* New Yorker.

Notes above transcribe the familiar yodel of male loon, which is used to both define and defend its territory.

years.) Many observers insist that the same two loons return to the same territory year after year.

The loons copulate on land and build crude nests at the water's edge where they can slip quickly to safety if they need to. They usually lay two eggs but may end up rearing only one chick per year, according to researcher Judith McIntyre. There are many dangers in the world for loon chicks. The parent birds share incubation and care, but can be frightened from the nest. The eggs may then be stolen by raccoons or gulls. These predators have expanded their ranges, following garbage dumps as our vacation cabins and towns spread. After loon chicks hatch, there's a chance they may be eaten by large fish.

When wildlife biologist Gary Dulin was a graduate student at Central Michigan University, he discovered that, within five days of hatching, one chick establishes dominance over the other and thereafter receives the most food and is generally treated better by the parents. In a videotape documenting this, cinematographer Peter Roberts has filmed two tiny, black fluff balls, loons recently hatched, fiercely jabbing each other, fighting in the water, while their agitated parents swim nearby. The lesser chick, nature's spare as it were, may die after only a few weeks.

In their first summer, loons grow into their gray juvenal plumage and learn to fish for themselves. As summer ends and autumn begins, loons cease defending territories and begin to gather together in increasing numbers. It is not unusual to see 20 to 25 birds in a group at that time. The adults, usually beginning a partial molt into grayness, leave first for the winter seas, and the juveniles, their flight feathers in place, leave soon after.

Getting ready for the big trip

Common loons winter in the ocean off the East and West coasts, in the Gulf of Mexico and along the coasts of Europe—dull, inconspicuous, seldom noticed. In the spring, mature loons, having completed the second stage of their molt and grown fine, new wing feathers, fly back North for breeding. Little is known about the juveniles, who do not reach sexual maturity or grow showy feathers for several years.

Last winter, I went to Utica College in Utica, New York, to talk to Judith McIntyre, who teaches there and whose new book, *The Common Loon: Spirit of Northern Lakes*, is the last word on the subject. The night before I arrived she and her husband, Pat, had been out on a mission of mercy. A migrating male loon, mistaking a rain-slicked highway for a body of water, had crash-landed on it during a storm. Someone had rescued him but had put him in a lake too small for him to gain enough taxiing speed for lift-off. The loon was stranded. Giving up tickets to the local symphony, the McIntyres paddled out in a canoe and spotlighted the loon to blind and capture him. Judith took the opportunity to weigh, inspect and band the bird, and then turned him over to a colleague for release on a bigger body of water. The next day, while I was talking with her in her office, she received a call from another colleague who reported that 35 loons had come down on a similarly wet, reflecting highway near Hawk Mountain in Pennsylvania, and were being rescued, banded and sent on their way.

Judith McIntyre is a self-assured woman with an Indian-like profile. She has an undergraduate degree in French from Carleton College and worked for many years as an interior decorator. She returned to college and in 1975 earned a doctorate in zoology. Today, at 58, she pursues a rigorous schedule of teaching, research and publishing, but she still finds time to share her work with nonprofessional loon fans who invite her to attend festivals and write in the popular press. In the trade she is known as the Loon Lady.

A loon attempting to get airborne "walks" across a lake. At the beginning of lengthy process, its wings make a racket slapping the water. The bird needs about a quarter of a mile to complete its takeoff run.

Loons can often be seen stretching and preening, but chances are this individual is getting ready to yodel.

With its feet back and head fully extended, a loon in flight transforms itself into a streamlined projectile.

One of the things McIntyre has studied is the effect of changing water levels on loons. Melting snows have always raised water levels in lakes but that rise usually does not make any difference to loons, who build their water's-edge nests later in the spring. When people dam a lake, however, the level is changed in accordance with human needs—water is drawn off for electric-power generation, for instance—and loon nest sites may be adversely affected. Low water may expose rocks and leave no weedy, protected spots near the edge where loons can clumsily drag themselves to nest. Conservative in their habits, the birds then may not nest at all. A rise in water, on the other hand, may flood nests and ruin eggs already laid. And if a loon pair loses their eggs later in the season, they will seldom nest and produce new eggs, for the summer contains barely enough days as it is for slow-developing loon chicks to grow to the size, strength and maturity

Bending itself into an S-shape, a loon rises up on its tail in display used to defend chicks or territory.

Bird scoots around in a crazy rush that may have a serious purpose but looks suspiciously like fun.

needed to migrate. In Minnesota, McIntyre developed a way to deal with this problem: floating nest sites that the loons accepted. Loon fanciers in other states, including New Hampshire, have found them helpful in places where the water level varies.

Sometimes, instead of disrupting loon nests, man-made reservoirs provide new habitat. Thoreau heard loons on Walden Pond but later, for nearly a century, they were absent in Massachusetts. Then, in 1975, a pair showed up at Quabbin, a reservoir. Last summer at least ten chicks were hatched in the Bay State, all but one of them on artificial bodies of water.

Loons adapt to people in other ways, too. It's true that building cabins on Northern lakefronts can destroy loon nest sites, and that loons unaccustomed to humans may, when disturbed by them, slip off their nests into the water and leave their eggs to chill or be taken by raccoons. But recent studies indicate that loons can also grow accustomed to people, and at least some may earn the label of "stickers." These are birds that seldom abandon their nests. Stickers must be the ones that those of us who have paddled in Northern waters have seen—cool, self-assured loons that swim right up to our canoes and look as hard at us as we look at them.

Other human impacts on water, such as dumping in it and riling it up, can be even harder on loons. These birds are sight hunters who dive deeply to catch small fish—yellow perch and the like. When the water becomes turbid, limited visibility forces them to feed on crayfish and other creatures that are less nutritious than fish. They may leave murky lakes because of this.

Worse yet for loons are the various other nastinesses we practice on our waters. Oil spills in the ocean kill loons in the winter. But mercury contamination of fresh waters—caused in part, researchers believe, by acid rain—is the worst problem of all for loons. Birds that accumulate mercury in their bodies and brains cannot see very well. They lose weight. They become confused and uncoordinated, abandon their nests and territories. Their nervous systems are harmed. Typically, loons gorge themselves before migration, and after a few years they may accumulate so much mercury from eating fish in contaminated waters that, stressed by migration, they arrive in wintering grounds in moribund condition and die in great numbers.

A staggering level of mortality

That is the theory, at least, of Laurence L. Alexander, a vertebrate zoologist at the Florida State Museum in Gainesville. He has been studying large numbers of dead and dying loons. Six years ago, 5,000 or more were found dead along the coast from Alabama to Florida and, although die-off rates have fluctuated since then, Alexander says the mortality pattern is still the same. "My data clearly show that the phenomenon that produced the staggering level of mortality in loons in 1983 continues in place from year to year."

The dying loons he sees are unable to dive. They're emaciated and filled with parasites. Some histological evidence Alexander has accumulated is consistent with heavy-metal poisoning. Unfortunately, since so few birds are banded, he is unable to prove that these loons

Zoologist Judith McIntyre, aka the Loon Lady, holds mike to record calls on a lake in the Adirondacks.

have fed on mercury-contaminated lakes, but, he says, "It is my tentative conclusion that high levels of mercury are killing the birds."

Mercury can get into lakes from dumping, pure and simple, but acid rain—falling over large areas of the Midwestern and Eastern parts of the continent—can also precipitate out naturally occurring mercury in soils and rocks, and rinse it down into the lakes. The fish and crayfish in those lakes store mercury in their tissues, and the loons, occupying the top of the food chain, accumulate it in theirs.

Loons are seldom hunted anymore, and for good reason: it's outlawed by the Migratory Bird Treaty Act. In fact, when one was shot in Maine recently the incident was reported by a fisherman, and the killer was arrested by a state game warden and fined $500. The Maine Audubon Society subsequently set up a reward fund for information "leading to the arrest and conviction of a person killing loons." In years past, loons were hunted for sport and killed in such great numbers that the practice, it is thought, may well have been a significant factor in the species' population decline.

In response to all the hurtful things we do to loons, fanciers have organized themselves to help and to defend the birds. And their work has had some surprising results. One of the strongest state organizations is New Hampshire's LPC, based in Meredith, which is also home to NALF. It is the LPC that sponsors research, coordinates the statewide efforts of volunteers and, with its paid staff of three wildlife biologists, generally keeps on top of what is going on in New Hampshire. The LPC regards loons as wild birds to be managed only as necessary. It protects them from disturbance and predation, using such means as Judith McIntyre's artificial floating nests, other devices that protect natural nest sites, and the so-called Loon Rangers, who keep an eye on boaters.

The LPC's efforts and the public education it sponsors seem to have helped increase loon numbers within New Hampshire. In 1976, when the LPC organized the first survey there, 271 loons were reported. Last summer there were 472. But even as the numbers have gone up, observers have been reporting a curious phenomenon—the presence of unusually large numbers of young unmated birds on certain of New Hampshire's larger lakes. These loons have acquired a bad reputation. Their very presence, it is said, disrupts the normal nesting and brooding behavior of established loon pairs. On Squam Lake, in the central part of the state, a group known as the "Gang of Ten" reportedly has caused incubating birds to leave their nests and may even have killed a pair of chicks. Scientists speculate that this kind of thing may be caused, ironically enough, by local overpopulation. The LPC is investigating.

When the loon festival was over, I stayed behind after most of the participants headed down the tree-lined driveway of the country club overlooking Lake Winnipesaukee where the event had taken place. Dusk came on and the loons, oblivious to the celebration that had been held in their honor, began to wail. We don't hold festivals for dusky seaside sparrows and we don't tell stories about them that become legends. We do that for animals who become our darlings—for harp seals, for pandas, for whales, for loons. There are some who dismiss this as boutique environmentalism. But that's a cheap shot. As soon as we respond with concern and appreciation and wonder to animals other than humans, we are lifted outside our crabbed homocentricity. Thinking about loons makes us consider other interrelated bits of the world: raccoons, gulls and perch; acid rain, power generation and our needs; and on and on. Every new area of concern raises new questions, some of them big ones. How do we want to use our land and water? How much should we fiddle with the lives of other animals? Are some animals better than others? How many loons are enough loons? And how do all the bits fit together? And it was this fitting-together question, the biggest one of all, that was on the minds of the old Inuit storytellers, I suspect, when they began spinning their tales about Raven and Loon.

Vivid symbol of wilderness on Northern lakes spreads magnificent wings after coming up from a long dive.

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By Robert Wernick

From out of the past come thundering hoofbeats of the demon 'nightmare'

Even Freud was frustrated trying to explain bad dreams, but recent studies at least identify the kinds of personalities most often afflicted

"Like there were androids coming up through the floorboards," said Susan. "ANDROIDS. They had corkscrews where their eyes should be, and they had three nostrils in each nose, and they breathed green smoke and it kind of scorched my feet, and I ran into the kitchen and they were coming out of the icemaker, and I ran and they were slicing at my heels, and I thought, this is a dream, I have to wake up. And there was this gang of hoods in black jackets jumping off the windowsills, and they had knives and hooks, and there was blood all over the floor, and I was screaming but the screams couldn't get out of my throat. And this time I really woke up, but it was a long time before I was sure I was back in bed. And I can still see those hooks, I can still see them."

Susan is a volunteer in a sleep laboratory, a place where people spend the night lying in hospital beds while technicians attach wires to their skulls to measure the intensity and duration of the activity going on in their brain cells during sleep, and wake them at strategic moments to record their dreams. The androids had come to visit Susan in the period between 4 and 7 o'clock in the morning; these are the hours when Man's old enemy the nightmare prefers to ride.

The nightmare has gone galloping through the minds of men and women since mankind began, and probably through the minds of our protohuman ancestors before that, awakening dread, stirring superstitious fears. The "mare" part of it, though some artists have imagined it as a death-pale white horse, was originally not a horse at all. In Anglo-Saxon, the word meant "demon." And for most of human history the nightmare has been taken as a visitor from the beyond, an incubus, a malign spirit sent to torment us.

Of course, incubi went out of fashion during the Age of Reason in the 18th century. Philosophers in the 19th preferred to blame nightmares on gastric upsets caused by too much rich food. In the 20th century we are convinced that they come from upheavals in the unconscious mind, that they are the shapes taken by suppressed terror, guilt, fear and shame emerging, once the reassuring light of day has faded, from the dark holes in which we try to keep them buried.

Wherever they come from, all nightmares are in essence identical to Susan's. They are, of course, dreams—though dreams of a very special kind—and like all dreams they seem to fuse recent events of waking life with the complex of memories and images that form the substratum of our minds. All human beings dream, and all, more or less often, have bad dreams, dreams of nightmarish anxiety and frustration. The professor dreams he has arrived in class not only without his lecture notes but with no knowledge at all of the subject he is to lecture about. The athlete dreams he has wandered off for a Coke at halftime and can't get back into the stadium, and they are about to kick off without him. The lady of high degree dreams that she advances to greet her guests and only notices too late that she is stark naked.

Such dreams can be excruciatingly embarrassing, yet the severe nightmare is a dream overlaid with a pervasive feeling of helplessness, powerlessness and the presence or threat of violence. The nightmare roars with malevolent energy. Its victim tends to be in a fix like that of the hero of Poe's "The Pit and the Pendulum," bound and helpless, watching while the razor-sharp blade of the pendulum swings with a steady, remorseless beat ever closer to his chest.

In unthreatening dreams there is room for an infinite variety of moods and attitudes. In nightmares, though the surface phenomena and the cast of characters may change as they do in dreams, the structure and the tone remain appallingly the same.

The Nightmare, an archetypal scene in a maiden's bedchamber, gives classic symbolism, featuring death-pale "mare" and a hideous, gnomelike incubus seated on the victim's chest. Artist was Henry Fuseli, 1781.

Like oppressive dread pervading George Tooker's *Subway,* late-night peaceful dreams can turn sinister.

In Susan's case, it is easy to derive the nightmare androids from the trashy movies she likes to go to, and the hoods from a real-life episode in which she went rashly walking through dangerous streets at midnight and got mugged. But the essence of Susan's dream was the terror, and it is this same intense, pervasive dread that has been closing in on her in nightmares since she started having them as a little girl.

The intensity of nightmares comes from the almost unbearable sense of reality that infuses them. Certain theoreticians of modern art have told us that the way to reach the innermost recesses of the psyche is through the use of abstract forms, but the mysterious dreamsmith who fashions nightmares follows a different process. By current esthetic standards nightmares must be regarded as masterpieces of kitsch. They are illusionistic, three-dimensional, garishly realistic. "Dreams with me," wrote Coleridge, who had constant nightmares, "are no Shadows, but the very Substances and foot-thick Calamities of my life."

"*My* life," he was careful to say. Nightmares are uncompromisingly egotistical. As Robert Louis Stevenson said of the "brownies" who provided him in dreams with material for his fiction (part of *Dr. Jekyll and Mr. Hyde* came straight out of one of his nightmares), they "have not a rudiment of what we call conscience." In Dostoyevski's *Crime and Punishment,* on the night that Raskolnikov determines to murder the old woman, he dreams of a drunken peasant who beats his poor suffering mare across the eyes, beating her to death because she is too weak to pull his cart. It is a powerful literary device, but as a nightmare it is somewhat suspect. In real-life nightmares, there is no time or inclination to worry about anything but ourselves. There are rare reports of mothers having altruistic nightmares involving threats to their children, but in the overwhelming majority of cases nightmares provide no room for the outside world. It is me, me, me in an agony of fear, who is being chased, lashed, flayed, eaten alive by prehistoric beasts or four-footed sharks. Nothing else seems to matter.

This feeling of solitary helplessness lends support to the theory that nightmares go back to a very primitive period of mankind's mental life, to a time when we were indeed helpless, alone, and surrounded by incomprehensible but very vivid dangers. According to Jung and his followers, this could be a racial memory implanted in the genes a million years ago by remote ancestors waking panicky in the blackness of a cave to become aware of the snorting, stinking presence of a bear. Most authorities these days think it more likely that the memory goes back to infancy, before we have any clear idea of who we are or what the outside world is all about. Babies in the cradle are continually assaulted by strange, looming shapes, and they do not have the power to make rational judgments about which mean good and which mean harm. Particularly sensitive babies may take fright at anything, even a

The author writes often for SMITHSONIAN. *In January he reported on the life and times of Francisco Goya and his sometimes nightmarish paintings.*

Then overwhelming anxieties emerge, amid the most unthreatening characters, mundane circumstances.

teddy bear, and it does little good for solicitous parents to try to shield them from unpleasant shocks.

Sentimental literature of the last two centuries has popularized the illusion that childhood dreams are pure innocence—the little angels lie peacefully in their cribs as if in Abraham's bosom while visions of buttercups and intimations of immortality pass through their heads. The real sleep of infants is far more hectic, just as their waking life is far more challenging and hazardous than parents like to think. A contemporary psychiatrist describes early childhood, accurately enough, as "a time of stress, worry and intrapsychic friction." Born with eyes that have not learned to focus, confronted every day with new faces, new relationships, a bewildering array of novelties, unexplained events and rules of behavior, the human child has to struggle heroically to get things squared away. In the first year of life, babies spend 9 hours of every 24 in what is called D-sleep or REM sleep—the kind of sleep during which dreams and nightmares arrive.

The D in D-sleep stands for desynchronized, or dreaming, sleep. Research has shown that the brains of all humans (and of most mammals for that matter, with one exception being the spiny anteater, a primitive beast indeed) go through a series of cycles during sleep. In humans, there are five or six such cycles every night. They start with what is called S, or synchronized, sleep, divided into four stages in which electroencephalograms show a steady change of electrical activity in the brain cells while the gradually relaxing body loses the tensions of its waking hours. This lasts for an hour or two, and before it begins again it is succeeded by a very different phenomenon, the 10 to 40 minutes of D-sleep.

D-sleep is also called REM (for "rapid eye movement") sleep because of the fluttering of the eyeballs produced in the sleeper. It is also referred to as paradoxical sleep (as opposed to orthodox S-sleep) because at first glance REM sleep doesn't make sense. On the one hand, it is the deepest form of sleep we know, the hardest to wake up from and the blessed time when the muscles of the body most thoroughly relax. Horses can remain standing through S-sleep, but when D-sleep starts their legs will not hold them up.

On the other hand, the onset of D-sleep is marked by a quickening of the pulse and a rise in blood pressure, and sporadic movements in small muscle groups. The electrical currents flowing from cell to cell in the brain pick up speed and intensity. The brain, in fact, is very active during D-sleep, sometimes more so than when we are awake. This is the same brain that keeps us going about our business during waking hours, deciding what we will have for lunch or how we will vote in the next election. But in sleep the brain works under different rules, with a different language, the language of dreams. In the earlier periods of D-sleep, these dreams tend to concentrate on recent events. In the later ones, memories come flooding out of the distant past.

Could sleep be an evolutionary mistake?

No one knows for sure why we dream, or why we sleep, for that matter. Sleep, which takes up a third or more of an animal's life and deprives it of the ability to eat or mate or defend itself in all that time, may seem a mistake in the evolutionary process. It's as if it were a kind of vermiform appendix that has somehow managed to get itself attached to the otherwise purposeful life of mammals and birds, and even in a rudimentary form to reptiles and fish.

The more the sleep process is studied, the more complicated it seems to be—from every point of view, chemical as well as psychological. But most scientists today would probably agree with William Shakespeare's commonsense line about "sleep that knits up the ravell'd sleave of care." S-sleep appears to provide relief from physical fatigue accumulated in waking hours. D-sleep seems to let the psyche absorb the events of those hours and fit them into the patterns that help us make some sense out of life.

As did Poe's narrator in "The Pit and the Pendulum," victims find themselves helpless and in jeopardy.

People have always been fascinated by dreams. But until recently, all of that interest was concentrated on what the dreams might mean, not on what was actually occurring in the brain. The patriarch Joseph won high honor for giving meteorological interpretations of the dreams of his pharaoh. Some Freudian analysts today make a comfortable living explaining how dreams reveal the unconscious mind, including the incestuous and murderous desires they claim we all had in infancy and later learned to repress. Not until the 1950s were dreams taken into the laboratory. Then researchers began wiring the skulls of sleeping volunteers like Susan to measure the electrical activity in their brains while they slept, waking them at intervals to check on the presence or absence of dreams.

Such studies have proliferated in the past quarter-century, and a beginning has been made at least in identifying the different stages of sleep and the chemical changes in the brain that accompany them (SMITHSONIAN, November 1978). The study of nightmares, however, has been curiously neglected.

Freud, for instance, had little to say about them. Early on, he tried to include them in his general theories about dreams and the subconcious, but they didn't completely fit and he rarely mentioned them again in his later writings. There are a few books on nightmares, but the knowledge they have to impart is highly unsystematic. Instead, one finds nightmares reported to have occurred in the sleep of famous people from Nebuchadrezzar to Mark Twain, many of them fascinating, few necessarily accurate. And books exist on the clinical aspects, i.e., the nightmare as symptom.

It is true that nightmares can be symptoms of psychotic states, as they can be symptoms of the onset of epilepsy and other diseases. Ernest Jones, the friend and biographer of Freud, concluded on the basis of a number of his patients that nightmares rise from guilt feelings over repressed incestuous desire. Even assuming he was right about his own particular patients, this would leave unanswered the question of why some people have nightmares and others, who presumably have the same urges, do not. And by concentrating on those who sought help, the approach overlooks the larger group of those who did not. Ordinary experience, confirmed by recent statistical studies, assures us that most people who have occasional or even repeated nightmares have nothing drastically wrong with them; they lead what most people would regard as reasonably normal lives.

Only very recently have there been serious efforts to find out how many people in the general population actually have nightmares. The results so far are inconclusive. Yet it seems fair to say that a very large number of people, perhaps as much as half the adult population, have occasional nightmares (more than once a year) and a very small number, perhaps less than 5 percent, have them regularly and often (more than once a week).

Nightmares as high fashion?

Why do some people have nightmares and others do not? Some hints can be derived from studies like the one at the University of Toronto, which showed that out of 314 students surveyed, art majors were three times as likely to have nightmares as were physical-education majors. Such statistics have to be taken with a grain of salt, since all they perhaps prove is that nightmares are considered rather fashionable in the art world, while athletes may be ashamed of admitting they can be scared out of their wits by a mere dream. The

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finding does indicate, though, that certain types of personalities may be more nightmare-prone than others.

Thus far, the most ambitious effort to identify these personality differences has been undertaken by Ernest Hartmann, a professor at Tufts University School of Medicine, who directs a sleep research laboratory at Boston's Lemuel Shattuck Hospital. Since 1977, Hartmann has done several intensive studies of more than 100 frequent and longtime nightmare sufferers, subjecting them to batteries of tests, interviewing their families and comparing them to control groups. In the process, he has overthrown many of the old beliefs about nightmares.

For one thing, he and other researchers now decisively separate two phenomena that in previous literature were confounded under the heading of nightmares. On the one hand, there is the true nightmare, which is a dream, often a long and complicated one, details of which may remain terribly vivid to the dreamer long after waking. On the other hand, there is the "night terror" from which the sleeper suddenly wakes in great fright, often screaming and sometimes going off in a sleepwalking trance.

Such episodes are fairly common in childhood, and they can continue on into adult life. Unlike true nightmares, night terrors usually occur in the first two hours of sleep. Unlike the rich texture of the nightmare, they are bare; no story is connected with them, no fangs dripping blood. The sleeper remembers nothing at all, or at the very most a single frightening impression on the order of "something is sitting on me." Hartmann is among a group of researchers who say such night terrors should not be classified as dreams; instead, they are merely anomalies in the waking-up process. For some reason, instead of proceeding with normal smoothness, the awakening sleeper gets an unpleasant jolt that temporarily disorients him.

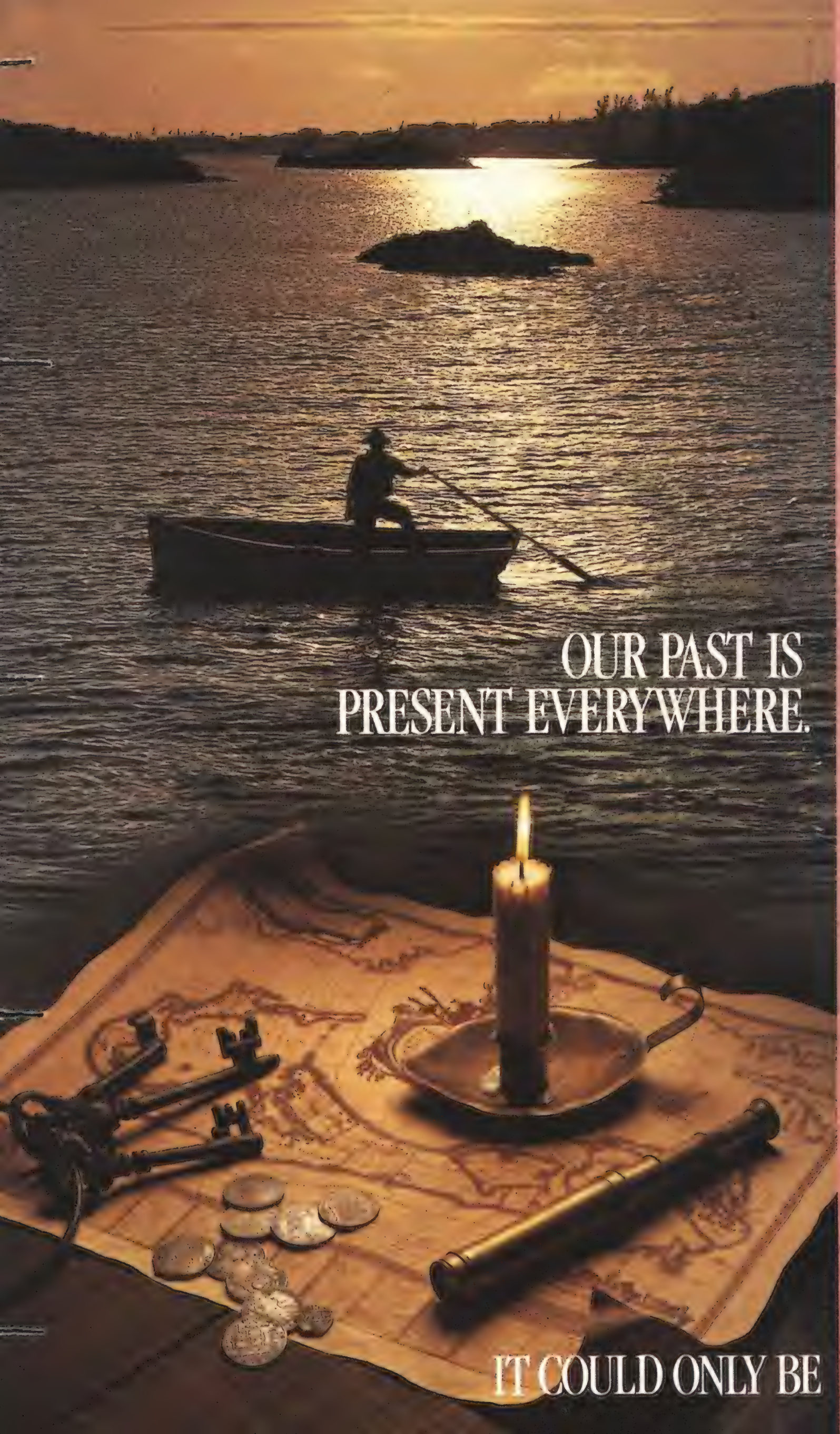
Night terrors can be horrifying

Whatever they are, night terrors are seldom of serious consequence, no matter how horrifying they may appear to solicitous parents. Outside of taking commonsense precautions—like making sure a sleepwalker does not go to bed near an open window or on a balcony—there is nothing much to do about them. As for adolescents and adults, stress can increase the incidence of night terrors; a sudden flare-up may be the result of too much alcohol or drugs. Night terrors in children (most frequent between the ages of 3 and 8) can be cut down or eliminated by seeing that a child is on a consistent sleep schedule and doesn't get too tired. Though most of the time, the last thing such children need is fluttering concern or medication. Psychoanalyst Melanie Klein recommended in 1926 that every child who wakes up screaming should be subjected to analysis by play therapy so that the "ground would be cut away from under the neurosis." Since close to half of all children have such frights now and then, and since the average analysis lasts at least two years, such a proposal would create a class of millionaire analysts and turn half the world's parents into gibbering idiots.

After weeding out night terrors, Hartmann was left with what he could accept as true nightmares. He acquired the population for his studies by putting ads in the Boston papers, asking people who had suffered frequent nightmares through much of their lives to volunteer for a medical psychological study. Many of those who volunteered turned out to be graduate students, musicians, actors and craftspersons—people who did work of a creative nature. It might be thought that sleeping on a hospital bed in a laboratory surrounded by personnel in white uniforms and all kinds of mysterious wires and dials would create a nightmare situation of its own. Actually the volunteers have fewer nightmares when they are being observed than when they are alone. Apparently the uniforms and the medical apparatus give them a certain sense of security.

All nightmares involve terror, but Hartmann, like

In *The Scream*, Edvard Munch chillingly captures nightmare's surreal atmosphere and unreasoning fear.



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"Oh, to dream once more the untroubled dreams of childhood!"

Babies' sleep may be fraught with fears; some experts say nightmares start in emotional turmoil of infancy.

other researchers, thinks it may come in two different forms. The standard nightmare, the one that goes back to early childhood, for instance, rarely repeats itself in its details. The shape, the size, the very identity of the menacing enemy can change from night to night and from year to year. Fragments of recent experience can work their way in. Books and television help change the stage setting. The child who was once attacked by Nazis or by gangsters is now waylaid by extraterrestrials.

There is, however, another category of nightmare, one in which everything remains the same, the scene of horror is repeated over and over again in remorselessly identical detail. Known as post-traumatic nightmares, they are created by real, and devastating, events in the outside world that the dreamer has lived through and is unable to forget. The event may be an automobile accident, a fire; it may be torture and degradation in a concentration camp or the death of a best friend fighting alongside you in Vietnam. It is an experience too horrible for the mind to accept. Such nightmares do not need the deep repose of D-sleep to force their way upward; they can turn up in any stage of sleep. They can even turn up as hallucinations, or "daymares," in broad daylight.

In most cases the mind begins little by little to accept the horror and it eventually goes the way of other experiences, providing material for ordinary dreams. But sometimes such horrors refuse to go away, creating a crippling sense of guilt and helplessness. The best thing to do with a post-traumatic nightmare is to talk it out, preferably in the early stages. A few people in the modern world have a peculiarly horrible vision that recurs. They are lying bound and helpless on a table while masked figures holding sharp knives peer grimly down at them. They may think they are going crazy. If this is the case, it does them good to realize that they are not acting out a scene from a horror comic, that this is exactly what *did* happen to them. They *were* in the hospital for an operation, anesthetized, but the anesthetic partly wore off, leaving their muscles paralyzed but their senses partly alert, and they could see the sharp steel and even feel some of the pain without being able to resist or say a word. Hospitals don't like to admit that such things happen, but they do occur from time to time, and it may save the sanity of the patient to know that he is not having hallucinations.

However, nightmares apparently set off by a terrible event in adult life may in fact have roots deep in the past. A classic case is that of the World War II veteran who had a recurrent nightmare of a human head lying on a road. It seemed a clear enough reminiscence of some repressed war experience until he happened to remember an event that had devastated his early childhood. He had been passionately devoted to a pet guinea pig. One day the pet was gone and he was heartbroken. A few days later there was a rare treat, a meat sauce on the family's spaghetti, and (through some ghoulish sequence of events) there in the sauce on his plate he found the head of his pet.

Frequent nightmare sufferers are a group apart

Horrible experiences like this can happen to anyone. And yet not everyone who has endured a horror has nightmares. Why? Hartmann's studies suggest that people who suffer very frequent nightmares (at least once a week) do tend to form a group apart. Unlike people with night terrors, who score like a cross section of the general population on the standard tests that psychologists give to classify personality traits, Hartmann's sample, though admittedly rather extreme, showed significant differences from the norm. "As a group," he writes, "they were persons living in society, working to support themselves, or in school." But many saw themselves as rebels and some actively rejected society or saw

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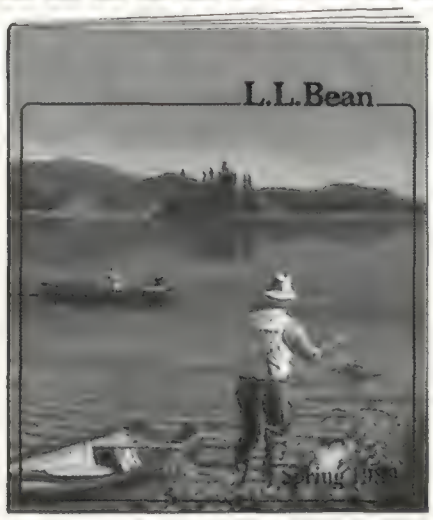

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themselves as rejected by it. Most felt from childhood on that they were a little different from other people.

Hartmann thinks that difference can be defined in terms of what he calls boundaries. In order to live at all, we have to compartmentalize, we have to divide up our experience in certain ways. But we all do it in different ways. For some people, the compartments are airtight. Everything is in its place, clearly delineated, with a firm protective boundary around it. Such people, says Hartmann, very rarely have nightmares. At the other extreme are people whose sense of boundary is soft and undefined. They find it difficult to keep fantasy and reality separate. Even when they *are* awake they may find themselves drifting off into daydreams that they find hard to keep apart from reality. They do not have a firm, clear idea of their own identity.

When we dream, most of us are aware of ourselves at the center of the dream; we keep the same identity papers throughout. But, according to Hartmann, the frequent dreamer of nightmares always feels a victim of terror; he can turn abruptly into somebody else, even into an animal, as the hero of Kafka's "Metamorphosis" turned into a giant bug.

Even when wide awake, frequent nightmare victims may be less aware of the hard-and-fast lines regulating what we think of as workaday human behavior. They find it easy, sometimes alarmingly so, to put themselves in someone else's skin and feel what their neighbors are feeling. They may see themselves as being attuned to an extrasensory force, which the duller senses of the rest of mankind cannot respond to at all. Their memory goes back further in time than that of most people. Frequent nightmare victims often can recall incidents that happened to them before the age of 3, even before the age of 2. Hartmann says that many of the people who had nightmares frequently enough to become part of his study, when given batteries of psychological tests had a few of the characteristics of schizophrenia.

Professor Hartmann insists, however, that a most important feature of his study is that the bulk of these people can and do live in the world as well as anyone else. "They could be called 'a little unusual,' " he says, "in that they are so open, empathetic, sensitive or artistic, but are certainly not headed for a life of constant or intermittent hospitalization for mental illness." He believes that their openness, their ability to ignore or transcend conventional boundaries, can be a positive help in careers, like teaching or therapy or the arts, that require intuition and understanding of others.

For people who are repeatedly racked by painful nightmares, therapy can be of some help. But since they come more often during times of stress, it is advisable to live as calmly as possible (although doing so is not often a matter of choice). For extreme cases there are medications that inhibit REM sleep and thus rid the sleeper of nightmares; unfortunately these can have unpleasant side effects. It is known that drugs like L-DOPA, which stimulates the production of dopamine in the brain and is used to treat Parkinson's disease, tend to cause galloping nightmares. It is known that people who go on alcoholic binges lose much of their D-sleep and have to make up for it when they stop drinking, which brings on a full dose of unpleasant dreams that can turn to bloody nightmares—what used to be called the screaming meemies. Eventually, perhaps enough will be known to enable physicians to bridle and tame the nightmare. Meanwhile, the beast must run wild.

There are a few consolations. Nightmares tend to diminish as we get older. In the course of time, the mind can become capable of absorbing and digesting memories once too painful to face, and the nightmare quiets down into an ordinary dream. It's not always as dramatic as the case of one of Hartmann's patients who used to dream of sharklike monsters coming out of the ocean to bite her, until she worked out her problems. Then she had a final dream about a shark, but this time it came out of her swimming pool and curled up at her feet, waiting to be scratched.

It may be, too, that nightmares have a certain therapeutic function. It can do us all good to be reminded from time to time that the world is not the orderly commonsensical place we like to think it. The complacent, rational mind sometimes needs to be reminded, in Robert Bridges' quaint phrase, that it "herits in / A haunted house," a house full of dark, terrifying places, where androids at any moment may start coming up through the floorboards.

Matthias Grünewald's devils in *Temptation of Saint Anthony* may rise from images that haunt Man's sleep.

By Alice J. Kelvin

Cheek to cheek is doubly chic, the second time around

In nightclubs and dance schools, the young and the young at heart rediscover the elegant, romantic pleasures of ballroom dancing

Irene and Vernon Castle show off the Castle Walk during ballroom dancing's heyday around World War I.

Well, there I go again. I feel young and beautiful and glamorous. I am swirling across the dance floor secure in the firm embrace of my partner. We are waltzing to the music of years gone by and we sigh as we move—one, two, three, one, two, three. Our hearts are light and we look elegant, my shoulders bare above a fitted, floral party dress and my partner dashing in his tuxedo with satin lapels. We dip and sway as we dance the night away. I know, I know, I'm getting carried away, but hasn't it happened to you?

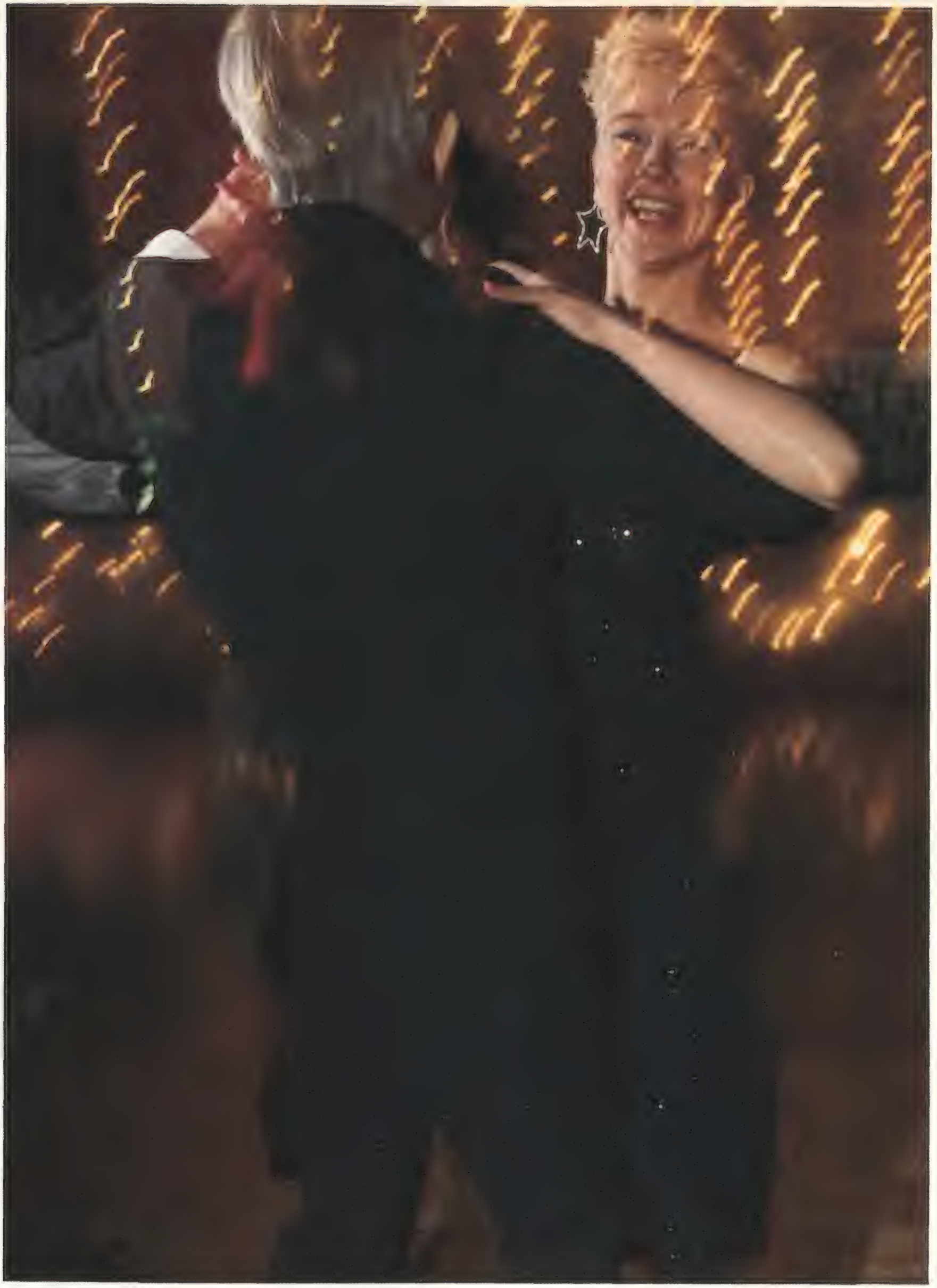
A pause. And the beat of the music changes and we add a little zing to our movements as we start the swing to "In the Mood." We separate for a breathtaking moment and come back together again. Of course most of the romance is in the dance itself. When I move I fall in love and I am truly in heaven when I'm dancing cheek to cheek.

It seems I am not the only person who feels the magic. Thousands of men and women across the country have been similarly seduced by ballroom dancing, many for the second time around. It doesn't matter how old they are, where they come from or what they do for a living; they realize, or perhaps remember, that it takes two to tango—or rumba, foxtrot or waltz.

There's no question but that people are putting on their dancing shoes these days. The membership of the U.S. Amateur Ballroom Dancers Association, which has chapters in 24 states, has doubled in the past five years. Dance studios report enrollment up and the median age of students down. The University of Wisconsin, Yale, Wichita State, Brigham Young University, the University of Connecticut and the University of California, Berkeley are among the schools offering courses in ballroom dancing. At last year's U.S. Ballroom Championships in Miami more than 2,000 dancers from across the country and from 20 other nations showed up to compete for more than three dozen titles, and $50,000 in cash and prizes.

In New York City these days people can go ballroom dancing every night of the week, gliding their way across the floor at Cafe Society, the Cat Club, Maxim's, Roseland, the Rainbow Room, Red Blazers Too and the newly opened B^2. But the phenomenon is not limited to New York. Across the Hudson River, Eileen Keckeissen runs a 24-hour telephone tape called "Dial-A-Dance" that gives names, dates and locations for social dancing in New Jersey. ("People call up at all hours, even at 2 or 3 in the morning," she reports.) And in Minneapolis, when Doris Pease, editor and publisher of the magazine *Ballroom Dancing USA*, put together a directory that lists more than 1,000 dance spots,

Color photographs by Lauren Piperno



Couple dances for fun at the Eastern United States Ballroom Championship, which has lasted for 25 years.

Even during disco mania of '60s and '70s, "touch dancing" diehards found places for their pastime.

she learned that the largest number of ballrooms is in the Midwest. People are even taking dancing vacations. Cruise lines offer sojourns to San Juan and St. Thomas complete with big bands, cocktail parties and dance instruction.

"People like the elegance of ballroom dancing, the beauty in the movement," explains Fred Kaviani, manager of the Arthur Murray studio in New York City. "They like to wear tuxedos and gorgeous dresses and go out dancing. They seem to welcome the formality and a return to a conservative, more mannered time."

Nostalgia plays a role. "We play tunes that people remember," says Lois Costello, who sings with the Don Glasser Orchestra. "We've played Roseland since 1958, performing the old standards—a Gershwin medley, some Jerome Kern. Songs like 'You Stepped Out of a Dream' or 'The Very Thought of You' remind people of special moments from their past."

There is also a very practical reason for the increased interest. "An entire generation grew up in the rock era, starting in the '60s and '70s, and they *never, ever* danced together," says Larry Schulz, co-owner of the Sandra Cameron Dance Center. "Now they're at an age where they find themselves in professional situations—company functions, galas, balls—that require a certain sophistication. You can't just get up and disco all night."

Beyond that, with casual sex currently out of fashion, people are looking for new ways of getting to know one another—and there's no better place to do that than on a dance floor. Most studios have "practice sessions," or socials. Every student enrolled in a class attends, whether a novice or accomplished competitive dancer. "If I don't know someone at one of the practice sessions," says 28-year-old Joseph Ferrante, an analyst at a Wall Street brokerage firm who dances four nights a week at a studio, "I ask her if she wants to dance.

Couples waltz, tango, quickstep and fox-trot their way to the finals in the Standard Dance Competition.

Manny Rivera dances Argentine tango with Mayli Lee at a social session at the Stepping Out Dance Studio.

Mark and Barbara Lieberman (center) observe their wedding anniversary by dining and dancing at Maxim's.

This contest is part of the World Professional Dance Championships, held in a different country each year.

On the floor, we introduce ourselves and start talking. Usually, the conversation revolves around dancing, but I am now dating a woman from the studio."

Perhaps Olga Varvaro, an ageless woman who taught ballroom dancing at Roseland until 1982, sums it up best: "My God, it is absolutely beautiful when two people get together and dance a waltz or a fox-trot. It is wonderful to be in somebody's arms. There is really nothing like it!"

The entrepreneurs who opened the first public ballrooms understood perfectly well that there is nothing like it. George D. Grundy took a chance when he put in a dance floor, along with carnival acts and a skating rink, in the Grand Central Palace in 1912. It stood on a site that is now part of New York City's Grand Central Terminal. He hired instructors to teach at the Palace and charged 40 cents—a quarter for three lessons plus a nickel a dance; people came in droves.

Making the "wicked" Turkey Trot respectable

At that time, ballroom dancers Irene and Vernon Castle were a sensation in Europe. In Paris nightclubs, everybody wanted to learn the new ballroom dances the couple had developed. The Castles were just as popular when they brought their dances to America. They took so-called wicked social dances like the Turkey Trot and made them look respectable. Their appearance and dance style were considered chic, and inspired a wave of enthusiasm for ballroom dancing in the period just before World War I. (In 1939 Fred Astaire and Ginger Rogers starred in *The Story of Vernon and Irene Castle*, a film based on their lives.)

Then, in 1919, Roseland opened in New York City and a new chapter in ballroom dancing began. It had all started when a frustrated Louis J. Brecker couldn't find a nice place in Philadelphia to take his college sweetheart ballroom dancing. With enthusiasm and determination he persuaded a wealthy local brewer to put up $20,000, enabling Brecker to open the original Roseland in Philadelphia.

On a trip to New York City a year later, Brecker saw 6,000 customers jamming the ballroom at Grundy's Grand Central Palace. He sensed that New York was the place to be and, with $40,000 more from the brewer, opened a new Roseland at the corner of 51st and Broadway on New Year's Eve, 1919.

News spread that celebrities Florenz Ziegfeld and Will Rogers would show for opening night, and customers were enticed by the promise of two live bands and attractive hostesses. It took mounted police to control the crowds. At the appointed hour, patrons and profits poured in fast. Roseland's worldwide fame and success continued for the next 69 years. "We called Roseland my father's baby," explains Nancy Brecker

Leeds. "It was his passion." "Louis Brecker was kind, astute, a remarkable man," affirms John Lucchese, 70, a lawyer who moonlights as a professional ballroom dancing teacher. He claims to have practically lived at Roseland except for five years spent in the Army during World War II. "Brecker absolutely loved dancing and he loved everything about the dancing business."

Brecker abhorred the term "dance hall"; to him it smacked of the ordinary. He was a fastidious man who valued propriety above all. He wanted Roseland to be referred to as a "ballroom" and the "home of refined dancing." To emphasize propriety Brecker established a dress code. "Men were not allowed in without a jacket and a tie," reminisces Lucchese. If a man showed up without the proper attire, Roseland rented him what he needed. "The women dressed to the hilt! They wore everything from simple, tasteful little dresses to floor-length, sequined evening gowns. In Roseland's heyday during the '30s and '40s, formal attire was almost de rigueur."

Brecker also disdained the term "taxi dancers." He referred to them graciously as "hostesses" and Florence Forder kept them in line. As the chaperon, she saw to the monies and manners of her charges. She made sure they always sat like ladies, with hands folded on their laps, behind a roped-in dais until she introduced them to a ticket-bearing gentleman. She'd eye the dress on each hostess to determine whether it met with her approval: a dress could be cut no lower than the top of the sternum in front and the uppermost lumbar vertebra in back.

"There were also steadfast rules for the customers," declares Leeds. "If any of the customers tried to date the hostesses, out they went. That was strictly taboo. And the hostesses knew they would lose their jobs if they met a customer outside Roseland."

Despite the restrictions, Brecker remained uncomfortable about the taxi dancers. On opening night in 1919, the ballroom was filled with 150 hostesses; by 1951, there were only 4. Then he let them go, too.

Brecker was always a shrewd businessman and impresario. During the 1920s he staged some masterpieces of promotion. The particular fever of that decade was marathon dancing, and in exploiting it Brecker outdid all his competitors.

Exact details of the origins of marathon dancing are sketchy and sources disagree, but it seems that early in 1923 a couple somewhere in England danced for 9½ consecutive hours. In the United States, Alma Cummings, a hostess at the Audubon Ballroom on upper Broadway, fox-trotted her feet into exhaustion for a total of 27 consecutive hours. When this record was broken, Cummings again put on her dancing shoes and wore out a series of partners during 54 hours. Marathons were the rage, and no one could hold on to the championship title for more than a day or two before the record was broken by someone else.

Jumping onto the bandwagon, Lou Brecker held a marathon at Roseland and promoted it as the true world championship. At midnight on April 24, 1923, nine couples began whirling around the dance floor. Hours later the police arrived and ordered Brecker to stop the music, citing an arcane ordinance restricting endurance contests to 12 hours. This command didn't deter Brecker; he just summoned up his showbiz skills. "My father had a truck brought around to the back door and piled all the dancers into it," recounts Leeds. Brecker scooted off to Sheepshead Bay and chartered a 60-foot sloop, telling the captain to sail beyond the three-mile limit and police jurisdiction.

"They had a ball," adds Leeds. That was probably true, but they also got seasick. Apparently the sloop hit stormy seas and Brecker, who had wisely remained on shore, sent a telegram canceling the contest.

Roseland played to full houses seven nights a week through the early 1950s. From the '20s to the '40s, there were as many as 3,000 people there every night. One of them was Martin Rogers, 72, who, along with his wife, won the All-Around Competition at the Harvest Moon Ball in 1939. "I could dance at Roseland for hours, spending maybe 50 or 85 cents," he says today. "It was the era of the Big Bands and we danced to the music of Glenn Miller, the Dorsey Brothers, Artie Shaw, Harry James and Benny Goodman."

In 1956, Brecker moved Roseland around the corner to 52d Street, between Broadway and Eighth Avenue, where it remains today; but during the '60s and '70s business declined. People had taken up a new, sed-

When Alice J. Kelvin isn't on the dance floor, she is a free-lance writer in New York City specializing in dance, photography and psychology.

Roseland's famous taxi dancers, called "hostesses" by the owner, were a big draw during the 1920s and '30s. They were strictly chaperoned and could be fired for dating any gentleman they met at the ballroom.

The hopeful but weary contestants in a 1934 dance marathon in Washington, D.C. try to rest on their feet and keep moving.

When Chubby Checker introduced the twist in 1960, "no-touch dancing" replaced ballroom dancing until the current revival.

entary pastime—watching television. And rock'n'roll music made its debut. For a while *The Arthur Murray Party* coexisted with Dick Clark's *American Bandstand* on America's television sets.

In 1960, *American Bandstand* introduced Chubby Checker, who sang and danced the twist. Ballroom dancing would never be quite the same. For the next 20 years, touch dancing was out and dancing apart was in. Crowds of pleasure-seekers twisted the nights away (or wriggled to such spinoffs as the "swim," the "frug" or the "monkey") at cavernous, pulsating discos. As the story goes, honey-voiced crooner Bing Crosby groused, "They don't even touch each other; they'll be phoning in next."

Within weeks of its emergence, Brecker banned the twist and then disco dancing altogether. "My father was afraid that people would be so wild that they'd destroy the place," says Leeds. In 1977, he died and left Roseland to his daughter, and the first change she made was to reintroduce disco dancing. Four years later, she sold the legendary ballroom to New York-based real estate developer Albert Ginsberg for a lofty but undisclosed sum. The new owner brought back taxi dancers, but this time something new was added: men were hired as well as women. The 1980s price tag: a dollar a dance. Thursdays only.

Taxi dancer 1980s-style, former host Paul Douglas is favorite of professional dancer Joanna Richardella.

The hosts and hostesses no longer work for Roseland officially, but they still dance there once a week with their loyal, well-paying clientele. Unable to survive on their dance earnings alone, each has another job that pays the bills. "We've had a nurse, two teachers, one real estate salesman, a housewife, an actor and a psychotherapist in our ranks," says exuberant hostess Judy Petardi. And their customers are just as varied. "I've had one customer who's a lawyer, another who's a retired IRS man, and another who was in the military and still wears all his medals on his suits."

"When male hosts were introduced, the female customers went wild," laughs Paul Douglas, 31, one of the ex-hosts at Roseland."At first, they all wanted the same host at the same time; they had to learn to share." And, just as it was 40 years ago, most people want to dance and dance. "Basically, a woman will pay for a set," says the elegant Douglas. "That's a half-hour straight of either Latin or American dancing."

To accommodate the disco as well as the new rock concerts, Ginsberg renovated Roseland, but there are still memorabilia—a glass-enclosed Wall of Fame houses famous dancers' shoes, including those of Ann Miller, Betty Grable, Ray Bolger, George Raft, Ann Reinking, June Havoc and Gregory Hines. There is also a tribute to those who have danced and romanced there: an engraved plaque lists the 550 couples who met at Roseland and later married.

"I love music, I react so intensely"

Words like love, passion, joy and, sometimes, obsession come perhaps too easily to a ballroom dancer's lips. "Music prompts all dancing," offers Martin Rogers, a Roseland regular whose favorite dance these days is the dramatic Argentine tango. "I love music. I react so intensely that, after all these years, I still feel excited whenever I go to Roseland for an evening."

More than 40 years Rogers' junior, Joseph Ferrante confesses to much the same emotion. "When I dance, I'm dancing from my heart," he says. Ferrante, too, favors the tango—the traditional kind. "It's such a powerful dance! When I'm leading the tango, I get this feeling that I can do anything."

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DREXEL HERITAGE

Because it's home.

One of 550 couples who met on the Roseland dance floor and later married celebrates at a party given in honor of them all.

Martin Rogers, 72, who won a trophy at Roseland's 1939 Harvest Moon Ball, still loves to dance there at least twice a week.

I know exactly how these gentlemen feel. I am the same way and I've only recently entered the world of ballroom dancing. I'm learning the way thousands of others across the country are. I started my lessons at a dance school in an introductory course, the Whitman Sampler approach to ballroom dancing. In the short span of one month, my teacher at the Sandra Cameron Dance Center taught a little swing, fox-trot, waltz, tango, rumba and cha-cha. By the end of our first class, she had 25 novices, ranging in age from 25 to 45 and with backgrounds as varied as their ages, out on the dance floor.

Cameron, a three-time U.S. professional ballroom champion, says, "Most people don't want perfection; they just want to know enough to go out and enjoy dancing." But it's one thing to dance in the structured environment of a ballroom dance class with the teacher calling out the sequences, and quite another to go dancing in traffic at a nightclub.

Members of my class began our transition from class to club by attending practice sessions. Without a teacher calling out the moves we became more adventurous in our movements. Dancers at all levels of proficiency sought one another. The men, who are responsible for leading their partner, learned the art of floorcrafting, or weaving their way across the floor without playing bumper car or getting black-and-blue marks all over their partner's feet. During some practice sessions, I had the opportunity to dance with as many as 12 different partners, learning to adapt spontaneously to their individual styles.

After several sessions we built up enough self-confidence to go out for an evening on the town. It is quite acceptable for people who have met each other at the school to go out to nightspots together. I knew what I was ready for. I went looking for a place with perfect atmosphere, a magical place, for dancing. I found it at the newly renovated Rainbow Room in New York City. When my dancing partner and I arrived there, 65 floors up at Rockefeller Center, we were greeted by glowing glass and mahogany columns—an opulence that seemed appropriate to the evening ahead. We were escorted to a cozy table, elevated on the highest of three dining tiers, from which we gazed out on the Manhattan skyline. At least for a few hours, it was easy to pretend to be the elegant Audrey Hepburn and Fred Astaire in *Funny Face.*

"Coming here is a theatrical experience," declares restaurateur Joseph Baum, who operates the Rainbow Room. "Everything is choreographed to make people feel pampered." Even the way the two orchestras—one, a 12-piece American orchestra, the other a 6-piece Latin band—exchange places is perfectly coordinated. While couples fox-trot across the 32-foot revolving

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Henry Groskinsky

A computer controls the ever-changing iridescent light display in ceiling of the renovated Rainbow Room.

oak-and-maple dance floor, members of the orchestra are gradually replaced by the pianist, bass player and drummer from the band, who continue to play the same song at the same tempo. Moments later, the dancers realize that "As Time Goes By" has segued into "The Girl From Ipanema," and they start to cha-cha.

It took two years and $20 million to restore the luxurious nightclub to its original 1934 glamour. A rainbow of ever-changing colors glows from the domed ceiling, cocooning those who swirl below and illuminating the honey-colored dance floor with the ten-point compasslike star at its center. "But the Rainbow Room is not a monument," protests the effusive Baum; "it is not just something to look at; it is something to participate in."

And participate we do. All of us. Waiters flambé while dancers sway. With as much as a six-week wait for reservations, the 220-seat room is filled. People talk, celebrate, flirt, drink champagne and, of course, dance. Some are dressed to the nines in silks and satins; others arrive from work in acceptable suits.

My partner and I spend another heady evening at the newest haute boîte on the block, Maxim's. Structurally, it is the duplicate of Maxim's de Paris. Moments after we arrive my partner intones, "I am sure we are in Paris." I nod in agreement. Filled with French stained glass, gleaming floral sconces, and deep mahogany woodwork, and with miniature pink lamps gracing every table, this is an atmosphere of lace and plush intimacy. "People who come here know the crowd will be elegant," states Monty Zullo, Maxim's overseer. "After all, this is a see-and-be-seen place." On Saturday nights only, men must wear black tie. Accordingly, the women don haute couture and the dance floor becomes a sea of taffeta and organza, emeralds and diamonds.

Picking up the beat, then dancing close

Maxim's offers dancing to a five-piece orchestra every night. "We give the audience a full range of dance music," explains Zullo, "from the 'Blue Danube' waltz to 'Rock Around the Clock.' " At first my partner and I find the dancers somewhat stiff—this is society trying to let loose—but as the evening progresses, everyone begins to unwind and we fill the room with shared festivity. My partner and I rumba, and I think how great it is to be a woman. Then, we pick up the beat as we move our feet to the pizzazzy Broadway show tune "42nd Street." With the tender strains of "My Funny Valentine," we hold each other close.

Ballrooms across the country have opened their doors to the touch dance phenomena. From the Coconut Grove Ballroom in Santa Cruz, California, to the Coliseum Ballroom in St. Petersburg, Florida, to the Medina Ballroom near Minneapolis, thousands of enthusiasts dance nightly to the Big Band sounds. There are ballrooms that cater to a specific type of dance, from the tango to the precision waltz. But probably the biggest winner is swing. The origins of swing date back to 1910 when the Texas Tommy dancers first incorporated the breakaway, the temporary and energetic separating of partners, in their performance in the *Darktown Follies,* one of the early all-black revues. The movement was distinctly unwaltzlike and non-European. During the '20s, black dancers in Harlem, in response to the newly popular jazz and rhythm-and-blues music, took the next steps, improvising rocking and turning movements, and combining them with the Charleston. This style was known as the "Lindy Hop," named after the first transatlantic flight by Charles Lindbergh.

Perhaps because it is truly an American dance form, swing has spawned fleet-footed followers from coast to coast. "Swing is an American dance; it came out of American music—jazz, and rhythm and blues," explains Craig R. Hutchinson, a retired Army colonel and author of a swing dancer's manual. "All the other ballroom dances, except the fox-trot [first performed

For Bill Demby, the difference means getting another shot.

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in 1913 by American music-hall artist Harry Fox in that year's *Ziegfeld Follies*], are descended from European, Caribbean and South American dances."

But now, swing has almost as many different names as there are states with dancers doing it. California has "West Coast" swing (sometimes called "Western" swing), Texas has a variation called the "Dallas Push" and South Carolina has the "Carolina Shag," says dance teacher Margaret Batiuchok.

This bebopping, foot-stomping, freewheeling dance has inspired five societies, more than a hundred clubs and even a movement to get Congress to establish it as the national dance.

Ballroom dancing made the leap from the dance floor to the stage in 1984 when Pierre Dulaine and Yvonne Marceau founded the American Ballroom Theater Company. The four-time winners of the British Exhibition Competition felt it was time to move into a theatrical format and concentrate on the romance of dancing. Since their debut with *Sheer Romance* in New York City, they have performed nationally and internationally at sold-out houses including the Smithsonian.

So what is to become of all this longing, swooning and swaying? George Theiss, of Arthur Murray International, thinks competitions will fuel the increased popularity of ballroom dancing in America. "Ten years ago, there were not more than 15 major competitions," he says. "Last year, according to the National Dance Council, there were 83." Unofficially, the number easily exceeds 100. And the U.S. Olympic Committee has just recognized ballroom dancing as a sport—an early step toward making it an Olympic event.

As for me, I believe ballroom dancing is here for a long run because it's at once personal and universal. Ballroom dancing is *la danse d'amour*, the dance of love. I'll take the sequins and chiffon, the roses and romance, the misty reminiscing. I'll return to the unfettered dance floor and dance with elegant abandon.

There I go again.

The future of ballroom dancing rests on the talents of youngsters at American Star Ball Championships. Twins Robert (left) and Thomas D'Alessio are partners with sisters Desiree and Lani Glass in contest finals.

BRITTANY HAIFA LAHAINA WATERFORD BALI NICE SYDNEY TANGIER JUNEAU LENINGRAD NAWILIWILI LISBON VANCOUVER LIVORN

A MILLION TALES IN A HUNDRED TONGUES MIGHT DESCRIBE THIS PLACE.

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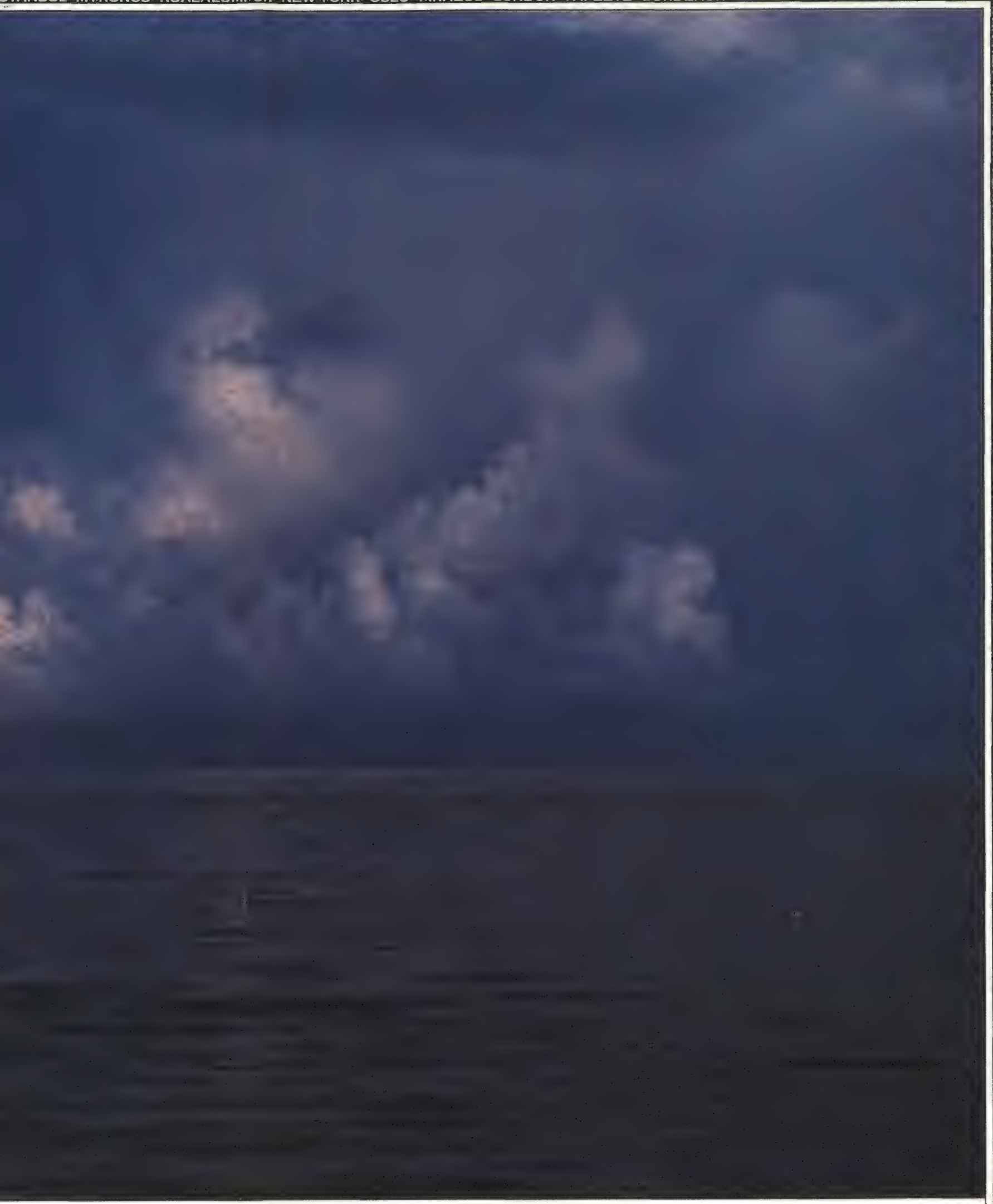
STANBUL MYKONOS KUALALUMPUR NEW YORK OSLO PIRAEUS LONDON PAPEETE BORDEAUX SOCHI BOSTON FT. LAUDERDALE



WHITTIER HAMBURG PLAYA DEL CARMEN NAPLES MANILA KETCHIKAN LAS PALMAS OCHO RIOS MELBOURNE PUERTO VALLARTA SHANGHAI CARTAGENA BRISBANE St. NAZAIRE

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ELOT.

are made up of a series of spectacular moments, fondly held in the mind forever. One never knows what tiny detail, what small task taken care of just so, will one day be the latch-key to such a memory.

It is why you will find fresh flowers in each of our staterooms; why we fly Maine lobsters halfway around the world to our ships; why we orchestrate and specify every detail of our European service; why our ships are painted and repainted to linger in the memory, a glorious and unforgettable white.

We charge a bit more for maintaining these standards, to be sure. But then, what we are doing—in the final analysis, years from now—may be nothing less than priceless.

Every day, without fail, high tea arrives at four o'clock. It is an unusual time on the seas, unforgettable to those who have experienced it. More often than not, a harpist plays, the ocean suddenly becomes glassy, and the ship—if not the entire world—seems to slow majestically.

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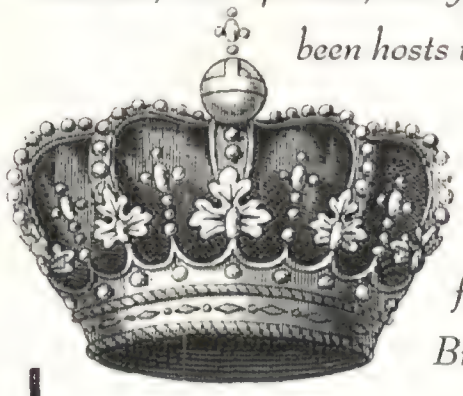

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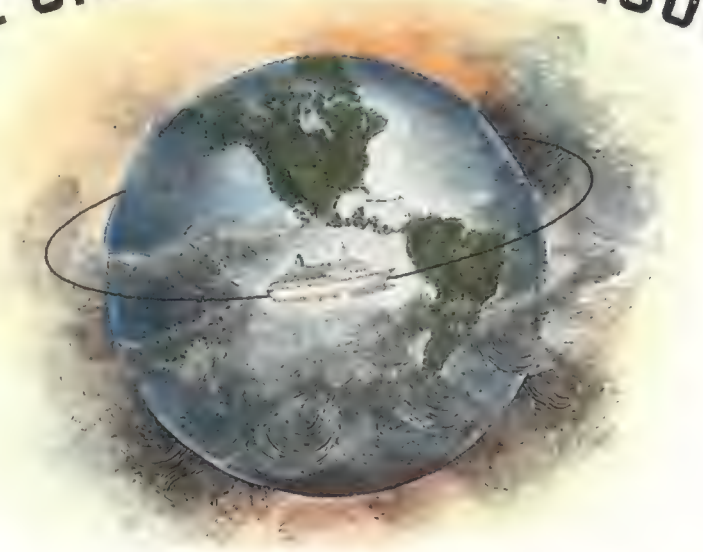
SEOUL CORFU STOCKHOLM AUCKLAND SYDNEY DUBLIN VENICE VILLEFRANCHE HALIFAX SAN FRANCISCO ACAPULCO

The Grand Adventure, 1989.



WINTER

Amazon
January 19 (12 days)
Manaus > Ft. Lauderdale

Trans-Canal
January 31, March 4
(15 days)
Ft. Lauderdale > California

February 16, March 20
(15 days)
California > Ft. Lauderdale

February 27 (12 days)
Callao > Ft. Lauderdale

Australia/New Zealand
January 30, February 23
(12 days)
Sydney > Auckland

February 11, March 7
(12 days)
Auckland > Sydney

South Seas
January 5 (24 days)
Los Angeles > Sydney

Pacific Orient
March 19 (20 days)
Sydney > Hong Kong

Hawaii-Tahiti
January 29 (16 days)
Los Angeles > Papeete

Easter Island
February 14 (13 days)
Papeete > Callao

World
Jan. 8, 1989 (100 days)
San Fran. > Ft. Laud.

SPRING

Amazon
April 5 (12 days)
Ft. Lauderdale > Manaus

April 17 (12 days)
Manaus > Ft. Lauderdale

China In-Depth
April 8 (14 days)
Hong Kong > Kobe

April 22 (14 days)
Kobe > Hong Kong

China Showcase
May 6, May 28 (14 days)
Hong Kong > Beijing

May 14 (14 days)
Beijing > Hong Kong

Trans-Atlantic
April 18 (15 days),
April 29 (9 days)
Ft. Lauderdale > Lisbon

Mediterranean
May 3 (13 days)
Lisbon > Venice

May 16 (13 days)
Venice > Lisbon

May 8 (12 days)
Lisbon > Istanbul

May 20 (12 days)
Istanbul > Venice

Connoisseur's Europe
May 29 (13 days)
Lisbon > Copenhagen

SUMMER

Alaska
July 4 (11 days)
San Fran. > Vancouver

July 15, July 26, August 6,
August 17 (11 days)
Vancouver > Vancouver

Canada/New England
August 26 (14 days)
New York > New York

China Showcase
June 5 (14 days)
Beijing > Tokyo

Trans-Pacific
June 19 (16 days)
Tokyo > San Francisco

August 28 (12 days)
Vancouver > Tokyo

Scandinavia/Russia
June 11, July 20, July 26
(13 days)
Round Trip Copenhagen

July 1 (13 days)
London > Copenhagen

August 2 (13 days)
Copenhagen > London

Connoisseur's Europe
June 19 (12 days)
Naples > London

August 21 (14 days)
London > Nice

North Cape/Murmansk
June 24 (14 days)
Round Trip Copenhagen

Fjords of Norway
July 8, July 14 (12 days)
Round Trip Copenhagen

British Isles
August 8 (13 days)
Copenhagen > London

Trans-Atlantic
August 15 (11 days)
London > New York

FALL

Canada/New England
Sept. 9, Sept. 23,
October 7 (14 days)
New York > New York

Trans-Canal
October 21 (19 days)
New York > California

Amazon
October 31 (12 days)
Ft. Lauderdale > Manaus

November 12 (12 days)
Manaus > Ft. Lauderdale

Panama Canal/Caribbean
November 24,
December 6,(12 days)
Round Trip Ft. Lauderdale

China
September 10 (14 days)
Tokyo > Hong Kong

October 16 (14 days)
Hong Kong > Kobe

October 30 (14 days)
Kobe > Hong Kong

September 24 (14 days)
Hong Kong > Beijing

October 2 (14 days)
Beijing > Hong Kong

Trade Winds
November 10 (38 days)
California > California

Jewels of the Orient
November 13 (12 days)
Hong Kong > Bangkok

November 25 (12 days)
Bangkok > Hong Kong

Mediterranean
September 4 (12 days)
Nice > Istanbul

September 16 (13 days)
Istanbul > Istanbul

September 29 (13 days)
Istanbul > Rome

October 12 (19 days)
Rome > Ft. Lauderdale

Trans-Canal Holiday
December 18 (17 days)
Ft. Lauderdale > California

December 18 (17 days)
California > Ft. Lauderdale

Pacific Orient Holiday
December 19 (20 days)
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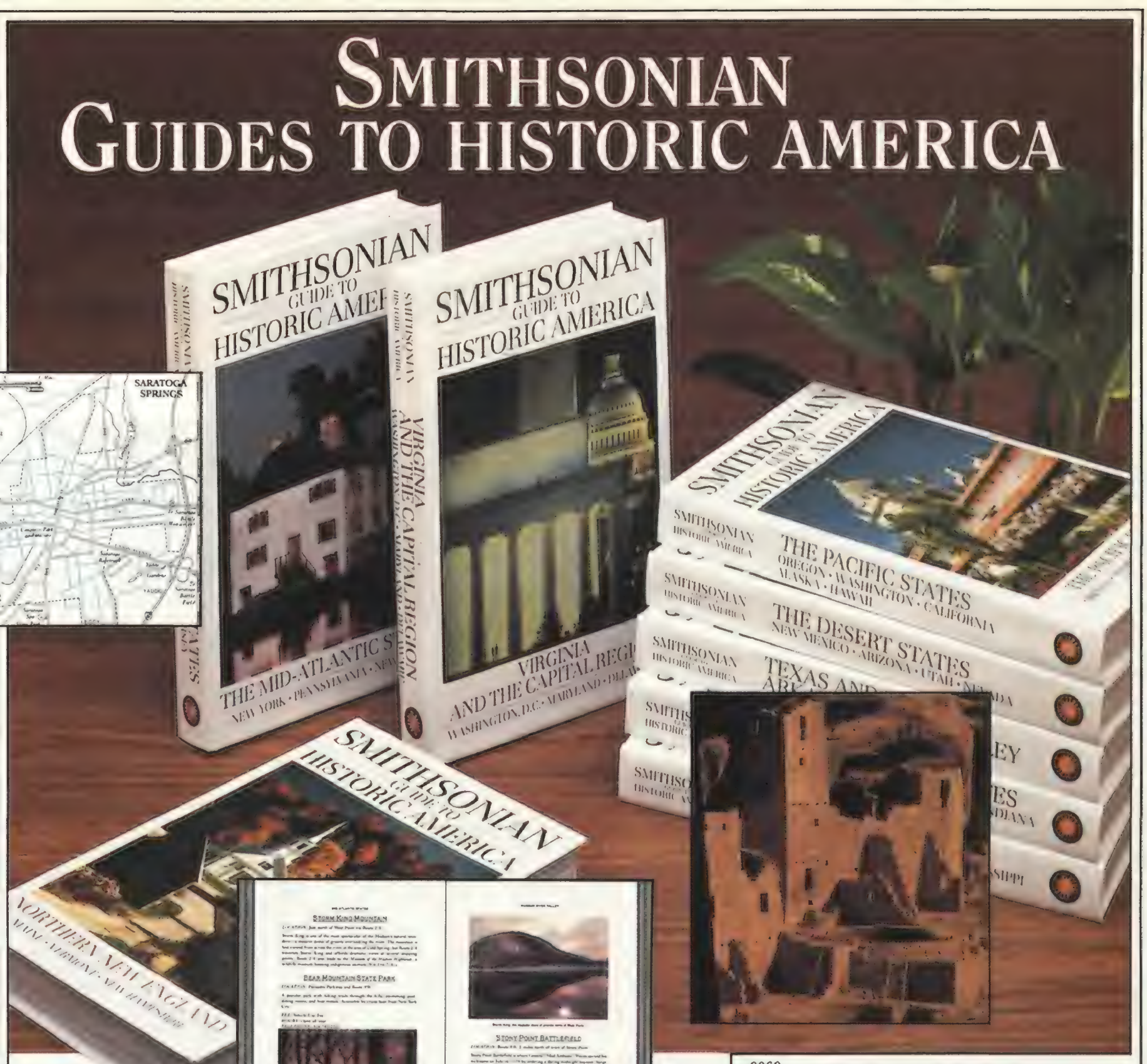
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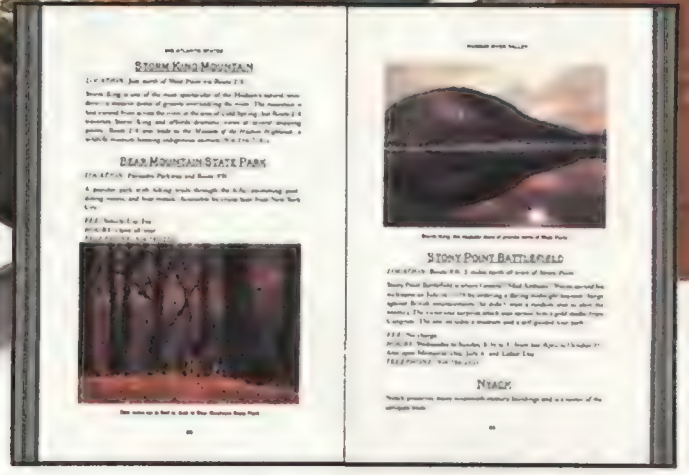

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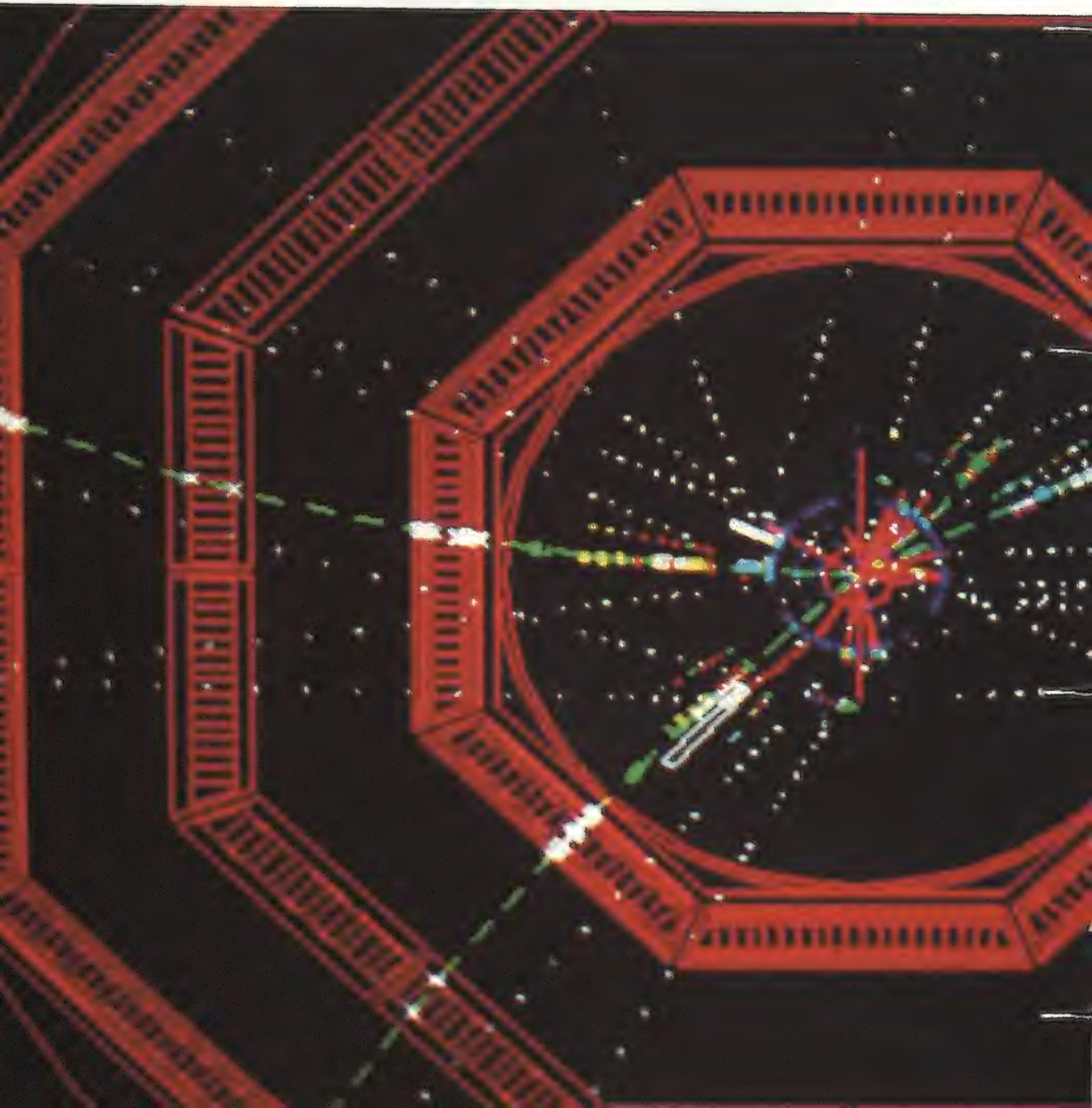
G52/G53

By Charles C. Mann

Armies of physicists struggle to discover proof of a Scot's brainchild



Finding something that fills the Universe may sound simple, but it is taking all the brains and money that scientists can muster

Twenty men in boots and hard hats pick their way through a construction site a few hundred yards from the border between Switzerland and France. The morning is hot and dry for May, but the ground is nonetheless muddy from the continued movement of bulldozers and trucks. The center of activity is a vast hangarlike structure or, more precisely, the pit at its center, more than 30 yards deep and almost as wide, cut into the soft French soil.

A tall, stoop-shouldered man named Samuel C. C. Ting leads the group. He is a physicist from the Massachusetts Institute of Technology, a Nobel Prize winner. He wears dark suits, immaculately clean, of no particular style, and dark ties, perfectly knotted, of no particular hue. Authority rests lightly on his shoulders. He and the people walking behind him are working on a colossal physics experiment; they come from China, the United States and a dozen other countries.

Known unromantically as L3, the experiment is designed to answer what would appear to be a fundamental question: Why are things heavy? Why, in a gravitational field, do they have weight? Or, as physicists would phrase the question: What is mass? We think mass is created by the actions of a type of subatomic particle known as the Higgs boson, named for Peter Higgs, the Scottish physicist who was one of the first to predict its existence. Yet scientists have never seen it, and are not certain where to look. Ting thinks his experiment can find the Higgs, if it exists. He may discover it, which could ultimately prove as significant an achievement as splitting the atom. Then, too, the discovery might just as well have no practical consequences. Or, the Higgs may not exist, after all.

The wind, keening in the open struts of the elevator, follows the scientists into the hole. Because nearby residents objected to the ugliness of the construction, an earthen berm stands between the hangar and the surrounding farms. As the car descends, the berm sweeps out of view; then the Jura Mountains, too, are hidden. By the end of the elevator ride, the scientists have journeyed into a world of their own making. It is a world some of them have never seen, despite having worked on the experiment for years. Then, when the elevator finally stops, jaws drop and a silence falls over the group.

Standing in the center of the pit is an octagon the size of an office building (p. 108), its huge side doors yawning open. It is an electromagnet, made of more metal than the Eiffel Tower, wound with hundreds of miles of cable. Some of the scientists are startled, even

Computer simulates collision (at center) of electrons, positrons, releasing a spray of energy and particles.

Photographs by Peter Menzel

Huge octagonal magnet will house layers of detectors; particle beams move through tunnel on back wall.

dismayed, by what is not there: the thousands of tons of equipment that remain to be stuffed into the pit. The magnet and all the apparatus that goes with it together constitute the heart of L3—the detector that may, just may, come up with the Higgs boson.

"When we first put the plans for this experiment down on paper, I knew the dimensions were big," Ting says at last. Usually his voice is toneless, careful, without edge even when administering the sharpest rebuke; you keep thinking you have missed bits of sentences. Now, however, he hesitates. "But it isn't till you see it that you get a feeling for how . . . big . . . it really is. I went down here a couple of days ago and I thought, 'This is crazy.' I thought, 'It can't be this size.'"

Seeking an answer better than Aristotle's

Why *are* things heavy? Artistotle thought objects are pulled to earth because they wish to return to it, and for much of Western history nobody came up with a better explanation. It was left for Kepler, Newton and their fellows to realize that heaviness came from the interaction of gravity with some other quality, which we today call "mass." It is the quality of an object that causes it to have inertia: that means you have to use force to get it moving if it is standing still, and you have to use force to stop it if it is already moving. You must use force whether you are on the surface of a planet or floating weightless between the stars. Mass is a quality an object always has; it is different from weight, which changes, or even disappears, with changing circumstances. Take an astronaut who, when he is on Earth, weighs 180 pounds. The moon's gravitational field is only one-sixth as strong as Earth's, so when that same astronaut is standing on the moon, he will feel he only weighs one-sixth as much. When he is in free-fall in a spacecraft, we say he is "weightless." His mass, however, is always the same 180 pounds.

Well into this century, physicists knew a lot about how mass behaved but did not know whence it derived or, more simply, what it was. "Mass is *the* great question of physics," says Abdus Salam, a Nobel Prize-winning physicist who is director of the International Centre for Theoretical Physics at Trieste. "We have fruitlessly banged our heads against it for centuries."

Today the search for the origins of mass has become, to the dismay of some researchers, one of the largest and most costly undertakings in the history of science. On both sides of the Atlantic, thousands of scientists and support staff are working to build the enormous machines that will be used in the quest. The L3 group, led by 450 physicists from 39 institutions, is but one of six groups of experimenters hoping to solve the mystery of mass.

The quest began, at least indirectly, during the

Monorail carries people and equipment around the 17 miles of LEP tunnel, crossing French-Swiss border four times on the way.

Samuel C. C. Ting oversees multinational team at CERN seeking the Higgs; its symbol (H_0) is on the board behind him.

1950s, when physicists first began to work out their grand unified theories, schemes in which the four fundamental forces in nature are only different manifestations of one and the same thing (SMITHSONIAN, May 1983). Part of the idea is that each force has an agent, a subatomic particle, that produces the effects we see. They are known collectively as gauge bosons. Photons, for example, "carry" the electromagnetic force, whether in the form of light waves, radio waves, x rays or gamma rays, among others. Mesons carry the strong force that holds the nucleus of an atom together. Scientists still have not seen gravitons, the particles postulated to carry gravity; and until recently, physicists had not even seen the particles, known as intermediate vector bosons or the W and Z particles, that carry the weak force, an obscure force central to the process of radioactive decay.

It was in the atmosphere of looking for unification theories that physicists such as Salam and Sheldon Glashow, now of Harvard, working independently, were toying with the idea that electromagnetism and the weak force could be brought together and seen as different manifestations of the same thing—the electroweak force. In the late 1950s, Glashow and Salam developed similar theories, but hit the same stumbling block: while much of the mathematics in each theory worked, there were major discrepancies between the particles that carried the forces. Photons have no mass at all; but even before they were actually seen, W and Z particles were predicted to be heavy—very heavy. (Many physicists had calculated their mass and had eventually come up with a similar ballpark figure. Each W or Z weighs more than 80 times what an entire hydrogen atom does.) Yet the equations of Glashow and Salam said that on some deeper level, the Ws and Zs should have no mass, like their sibling the photon. "It was a problem," Glashow has admitted. "It was a bit like saying a Ping-Pong ball and a bowling ball are somehow the same thing."

By the early 1960s, Glashow had begun to look into other areas of physics, but his childhood friend Steven Weinberg, now at the University of Texas, and Salam each continued looking for a way to describe the two forces as one. At the same time, a Scottish theorist, Peter Higgs, was at the University of Edinburgh working on a somewhat related problem. For several years the shy, soft-spoken, excessively modest Higgs had been investigating various aspects of field theory, which is the notion that all of space is saturated by a field, much as the field of a magnet saturates the region near it. Like the field of a magnet, the hypothetical field Higgs created had ephemeral particles that acted as its agents: these eventually came to be known as "Higgs bosons."

Higgs had been engaged in intense doodling, fiddling with equations, adding in one variable and taking out another to learn more about the nature of his hypo-

Charles C. Mann, coauthor of The Second Creation, *a 1986 book on particle physics, is now working on a scientific, social and economic history of aspirin.*

thetical field. It was at this point, around 1964, that he noticed something extraordinary. If he added in his own field equations (and thus the Higgs bosons) to equations somewhat analogous to those of Salam or Glashow, he found that certain particles in the original equation behaved in an astonishing fashion. They began with zero mass and then mathematically "ate up" other, unwanted particles in the field (ones that had made a mess of the mathematics of the theory he was investigating)—emerging with mass. (The unknown particles turned out to be the W and Z particles, but Higgs did not know that at the time.) Higgs published his findings—described by Glashow as a "terrifically loony idea; an idea that nobody would ever have paid attention to"—with little fanfare. Eventually, Salam and Weinberg independently heard about his work and realized it might solve their problem. Each added Higgs' equations into the ones they had been working on and—to their great delight—found that the particles that acquired mass in Higgs' equations corresponded to the W and Z particles in their own. Higgs' hypothetical boson provided the mechanism by which the electromagnetic and weak forces could finally be seen as one.

Higgs bosons might have been entirely forgotten if a groundswell of theoretical and experimental work in the 1970s had not led to the acceptance of the electroweak theory—and to Nobel Prizes for Glashow, Salam and Weinberg in 1979. Four years later the W and Z were discovered by a team led by Carlo Rubbia and Simon van der Meer, who quickly received Nobels for their efforts. Today the electroweak theory is inscribed in the textbooks, except for one not-so-little worry: nobody has seen even the slightest trace of the Higgs.

"And without the Higgs," jokes Paul Lecoq, a French member of the L3 collaboration, "Messrs. Glashow, Weinberg and Salam may eventually have to give back those little prizes they got in Sweden."

At Stanford, Burton Richter, whose design may revolutionize accelerators, stands inside the detector.

A globe-trotting Higgs searcher

In a long, high laboratory, Ulrich Becker wedges his way through a forest of electronic equipment and the cables and welding equipment necessary to hook it together. A big man with the square face and wiry, stand-up hair of a friendly monster, Becker has been one of Ting's chief collaborators for two decades. Born and raised in the Federal Republic of Germany, he is now a member of the international fraternity of science: citizen of West Germany, resident of France, worker in Switzerland, taxpayer of the United States. Like Ting, he is officially on the faculty of MIT but, like Ting, he has spent the past decade traveling the globe in quest of the Higgs.

"Put naively," Becker says, "most of the progress in particle physics for the past 20 years, this electroweak theory and everything else, depends on the supposition —the *guess*—that there is this field, the Higgs field, that saturates the whole Universe, and that particles get their mass from interacting with it. You might say it's a little like a magnet, with some kinds of metal being more attracted than others. Particles that are more 'attracted' to the Higgs have more mass. The picture is very nice, theoretically speaking—yet there is not one shred of evidence for it."

Ting's L3 group is based at the European Organization for Nuclear Research, still known to physicists around the world by its old acronym, CERN. The main campus is in a suburb of Geneva, but the laboratory has grown with physics itself: the L3 assembly area is in France, a few miles from the Swiss border. (Customs is a constant problem; recently, Becker recalls, he had to cross the frontier 12 times in a single afternoon; the border guard threatened to seize his car if he came through again that day.) A great circular tunnel connects the campus and the L3 pit; it houses an almost completed particle accelerator called the LEP, the Large Electron-Positron collider.

Accelerators are devices that smash subatomic particles into a target or into one another with enormous energy; in the resultant collisions, matter changes into energy and energy into matter, and the flying fragments provide clues to the laws of nature. They are usually built in the shape of a wheel; as particles move around the circumference, they are boosted to higher and higher speeds by powerful electric fields. Electrons, which at rest are very light, can be pushed to within

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Using computers and manual techniques, Stanford surveyors align magnets along the accelerator pipeline.

Strong magnetic fields will keep the electrons and positrons focused as they speed toward annihilation.

a whisker of the speed of light. At such relativistic speeds, however, the electron becomes heavy and difficult to turn in the necessary continuous circle. It takes huge amounts of electrical power to keep bending the beam of electrons, which keep losing energy in the form of x rays as they are forced to turn. To smooth out the turns, accelerators have become bigger and bigger around, not to mention more and more costly. The old proton accelerator at Brookhaven National Laboratory on New York's Long Island is just half a mile around. The main accelerator ring at the Fermi National Accelerator Laboratory in Batavia, Illinois, is nearly 4 miles around. The LEP in Geneva, when it is commissioned in July, will be 17 miles around—the largest in the world. Someday it may be eclipsed in its turn by the planned Superconducting Super Collider (SSC) in West Texas, which will have a circumference of about 53 miles—and which some investigators think may ultimately have the best chance of finding the Higgs.

The LEP will achieve extraordinary energy levels in two ways. First, instead of having the beam smash into stationary targets, the LEP will have two beams moving in opposite directions. It will be the difference between a car running into a tree and one car colliding head-on with another. Second, the electrons will collide with their antimatter counterpart, positrons, producing total annihilation. Some collisions will produce Zs, the neutral agents of the weak force. A few of these, theory predicts, will fall apart into Higgs bosons, which in turn will decay into a spray of other particles. The Zs and Higgses will live so briefly—trillionths of a trillionth of a second—that they will be impossible to see directly. But the end product, the spray of other particles, can be seen by complex detectors, and from it the researchers hope to infer the existence and properties of the Higgs (pp. 106-07).

When the accelerator cranks up this summer, four experiments, all multimillion-dollar collaborations, will begin work. L3 is the biggest, the most expensive and the most directly aimed at the Higgs. The project began in 1979, when Ting, Becker and a small number of other physicists started designing an ambitious machine, a detector, that they hoped would trap the Higgs if, indeed, it exists. "We asked CERN for the biggest hole they would give us," coleader Hans Hofer

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of Zurich says. "It turned out that we could fill it up completely with a detector the size of a four-story building." This is the octagon in the pit, a massive tube stuffed with electronics. Electrons and positrons will collide at its center; different detector parts will measure different particles flying outward from the violence.

"I hope," Becker says drily, "that Mr. Higgs is pleased by how much trouble we have gone to in trying to find his little particle." His train of thought is interrupted by the screech of a million fingernails being dragged across a million blackboards as CERN workers drag a 20-foot-high metal rack across the concrete floor. "You know," Becker shouts over the noise, "nobody sees Higgs! He just sits up there in Edinburgh! My graduate students come to me all the time, asking me 'Who is this man Higgs? Does he really exist?'"

On the wall behind Becker is a painting of an object vaguely resembling a Ferris wheel. It is the section of the detector to which Becker has devoted nearly ten years of his life; the completed structure is more than 30 feet in diameter, yet measures the trajectories of particles called muons to within a thousandth of a millimeter. Within the wheel is a lacework of laser lights, each centered on a photosensitive cell.

Like an onion, Becker explains, the detector consists of layers of instruments, each intended to measure a specific type of particle. Each layer takes years of work, costs millions of dollars and requires delicate negotiations among the dozens of institutions and nations involved. Each brings unexpected benefits to industry: by giving one order to a company that made plastic whiskers for teddy bears, for example, L3 launched the firm into the fiber-optics business.

As Becker speaks, fatigue informs his voice; he has accumulated a quarter of a million miles in air travel. There are shadows under his eyes and he often finds he needs to vent his frustrations by working on his car. "Nobody would choose to work this way, on projects so big," he says. "But we have to, if we're going to chase after something like the Higgs. And, obviously, we have to hope the people at Stanford don't get there ahead of us."

Frustration and fury in a California lab

A group of men and women gather, shirtsleeved and disheveled, early one June morning at a laboratory just south of San Francisco. Outside, the California sky is as blue as heaven; inside, the light is dim and migraine green. In a chair against the wall slumps a round-faced man with bags beneath his tired eyes: the Nobel Prize-winning physicist and Stanford Linear Accelerator Center (SLAC) director, Burton Richter, who has designed the project on which they are working. He has staked the rest of his career, and those of everyone else in the room, on its completion. Richter, as it happens, shared his Nobel with Sam Ting in 1976 for their separate but simultaneous discovery of yet another subatomic particle, the J or Psi (SMITHSONIAN, July 1975). Silent as stone, Richter watches as, one after another, his colleagues recount the small, infuriating problems of the day before. Blown electronics. Inappropriate settings. Cooling difficulties. Human error. The list goes on and on. The project is more than a year behind schedule, and Richter's fury is as palpable in the room as a heavy fog.

"We're getting close," says Andrew Hutton, the tall, bearded Englishman acting as program deputy. "Close enough to proceed as if we were going to start for real."

"Not *as if*," Richter says. His voice is quiet, but his vehemence is unmistakable. "We *are* starting. It is real. We can't wait anymore on this. From now on, if something goes wrong, work around it. You can't do science waiting for everything to work right. I want us to start taking data at 4 P.M."

Hutton smiles. "You heard the man," he says. "In eight hours, we'll try to make history."

Like their rivals at CERN, the scientists at Stanford are working on a particle accelerator. Known as the SLAC Linear Collider (SLC), the device is as intricate and baffling as an Escher drawing. Richter, its designer, had a hand in the original design of the LEP. When he discovered that the United States would not pay for such a gigantic machine, he tried to come up with a smaller device that would do the same work, and at a fraction of the cost of a circular collider. The linear collider is the result.

Shaped somewhat like a two-mile-long tennis racket, it sends two pulses of particles—electrons and positrons—racing down the handle and around opposite sides of the head until they meet with soundless violence at the top. For most of the journey, the particles move in a

Karl Reismann, a technician from Aachen, West Germany, tests the circuits inside a CERN detector. This is an "end cap," which records particles that move off in the same direction as the original beams.

Jay Chapman checks wires that carry 30,000 channels of information from the "small" detector at Stanford.

Soviet physicist Yuri Kamyshkov rests in front of uranium blocks that trap and measure heavy particles.

Fireworks from the Superconducting Super Collider are still just a simulated gleam in a physicist's glasses.

straight line and do not lose energy by giving off x rays as they are forced to turn. That means the machine can be much smaller, and hence more quickly and inexpensively built, than a conventional accelerator. Many physicists believe that the SLAC Linear Collider is a prototype for future machines.

On the other hand, the two bunches of particles must collide on the first pass, instead of having many chances as they spin millions of times around a ring. The challenge is enormous: make two particle aggregations, each the thickness of a human hair, each traveling at a fraction less than the speed of light, smash together at the precise center of a detector.

Although construction began after the LEP, the hope was to finish the Stanford accelerator more than a year sooner, giving physicists there the first chance to find a Higgs. If all goes well, the machine's design will have been one of the most daring and successful gambles in recent science, and physicists in the United States will have leapfrogged their friends and competitors in Europe. *If*, that is, all goes well.

"There is a bare chance we can find the Higgs first," says Patricia Burchat, a young experimentalist at Stanford. "Like them, we will make Zs, some of which will decay into Higgses. The question is whether our machine will make enough Zs, and that, I'm afraid, is not at all clear."

"To get this project approved by the government," Richter says, "we cut the budget to the point where there was some doubt we would be able to build the machine. It was a risk, but with the U.S. budget deficit, it was the only way we could get the money."

The result is a bricolage, new equipment attached to another accelerator that was built in the 1960s. The jumble of old and new systems is an engineer's nightmare: like an exotic sports car, it works fine on blocks in the garage, but develops new problems on the road. The linear collider is now months behind, and every moment of additional delay further cuts the Americans' chances of getting there first.

At 4 that afternoon, Richter appears at the main control center for the first test run. Ninety minutes later, he is forced to leave in frustration: the machine is not working. With Richter gone, the staff continues to work before the computer screens lining one end of the long, dimly lighted room. The only sounds are the peeping of computer signals, the hush of air-conditioning and the occasional murmur of a dismayed voice. At a chair in the center, Hutton marks the log. A Briton, he is one of the relatively few scientists to work both in California and in Switzerland.

"We've done enough to show that the principle works," he says. "You *can* make the bunches collide, and the next generation of accelerators will be based on this one. But the curious thing is that a future triumph will not be enough to make the lab look good today. For that, we need to get this machine functioning ahead of our friends in Europe, and to get some physics done." Hutton laughs tiredly; he has been working for a long time without much sleep. "I must say that right now it would be really nice—truly nice—if a Z turned up on the screen."

They broke their hearts in San Francisco

A punishing heat wave blankets San Francisco Bay at the end of July, forcing the region to ration water. Faced with record 100-degree temperatures, the Stanford accelerator's components begin to malfunction. Water pumps break down. Flow switches give up the ghost. Microprocessors burn out. The 8 A.M. meetings become sweaty litanies of disaster. Five weeks after Richter ordered the machine to be turned on for real, the laboratory has managed to accumulate a bare 21 hours of data. Not a single Z has been seen. To make it worse, the Europeans are ahead of schedule; in an initial test, their accelerator has taken seven minutes to reach the goals scheduled to be achieved in seven days.

Richter has taken to haunting the control room. His face looks, says one friend, as if he were barely restraining himself from biting his fingernails. More and more, it is apparent that the jury-rigged machine was built too quickly and too cheaply. Richter is spending much time huddling with scientists like Martin Breidenbach, the wiry, intense leader of the principal experiment. Weeks before, Breidenbach had been happily splayed on his back, wrench in hand, beneath the team's detector; now he is being drawn to the accelerator itself, for without the machine there will be no particles to detect, no discoveries to make.

Back in his office at CERN, Sam Ting tells the

delegation from the Soviet Union "I don't know what your rules are. I don't even care. What I am saying is this: when the announcement of a discovery is made, the people on the podium are the ones who get the credit. If you want your scientists to get the credit they deserve, you will have to change your policies about not letting them work outside the Soviet Union. Obviously, the choice is up to you, not me." He smiles. "I am just a scientist, a lone professor at MIT."

For the first time in the meeting, the Soviets laugh. Whatever they think of their rules, experience has taught them that they are not dealing with lone professors at MIT. The face of physics has changed and research is now performed by huge collaborations, run by men with fierce and powerful wills. Richter, at Stanford, is one; Ting, at CERN, is another.

A moment later Ting says, "Nobody has spent all this time and money on these projects to do ordinary physics. I will consider this experiment to be an utter failure if someone finds the Higgs before we do or if we make a technical mistake that prevents us from making a major discovery." Tapping the symbol for the Higgs boson that he has written on the blackboard, Ting repeats the words slowly. "A . . . *major* discovery."

As the new year begins, tensions are running high at both CERN and Stanford. The California team is still testing, but hoped to have the machine on-line as early as March. In Geneva, physicists have finished installing the components of their massive detector, are hoping to begin testing in late winter or early spring, and plan to have the machine up and running by fall. In Scotland, serenity reigns. Sitting in his small office at the University of Edinburgh, Peter Higgs listens to the details of the gargantuan effort to find the particle whose existence he hypothesized so many years ago. "Of course I'm flattered by it all," he says. Afternoon light comes in the window, the same light that is filling the rolling hills outside with the colors of sunset. "Of course I like it when they give seminars on the search for the Higgs and so on. And of course I think it's important to look for. But—you want to know the truth? When I consider the huge sums going for this, the lifetimes spent on the search, I can't help but think: 'Good heavens, what have I done?'"

Peter Higgs considers the cosmos, perhaps permeated by a particle named for him, from a hill in Edinburgh. The reclusive Scottish physicist has mixed feelings about the huge cost of the race to find "his" boson.

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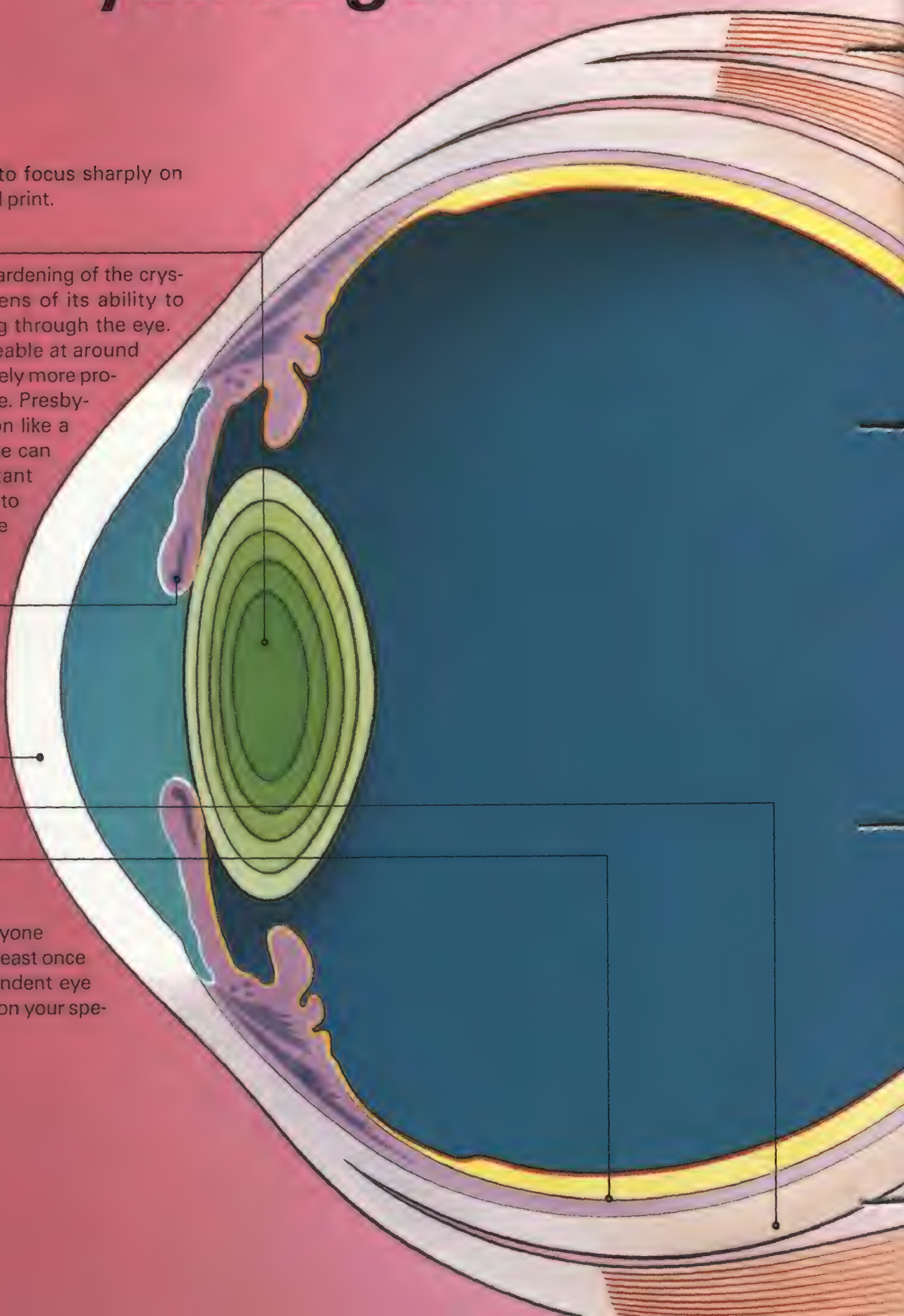

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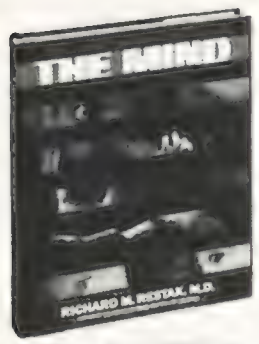

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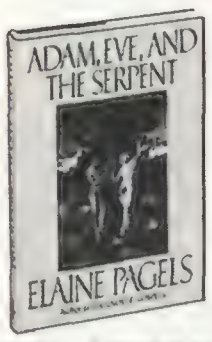

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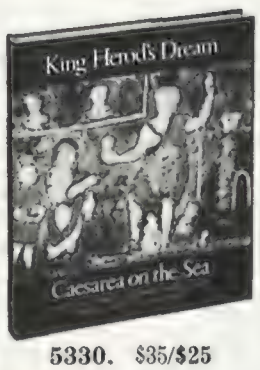

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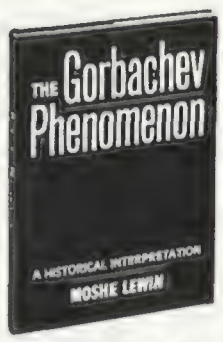

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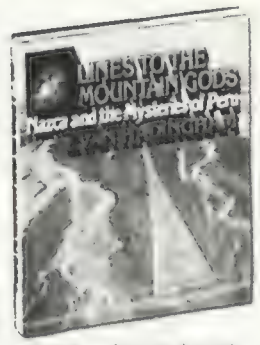

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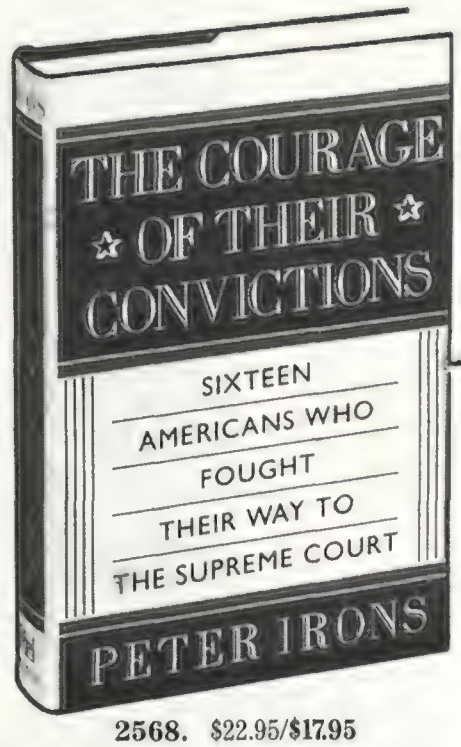

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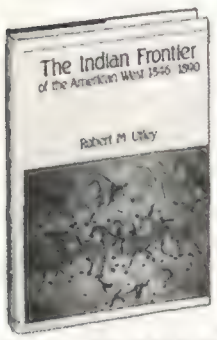

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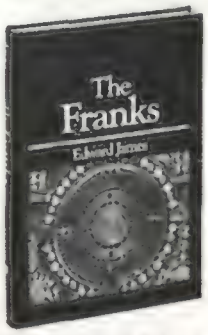

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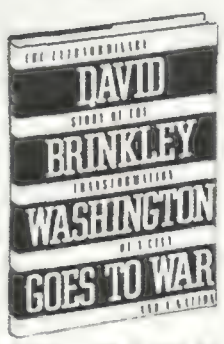

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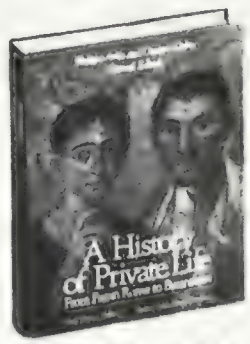

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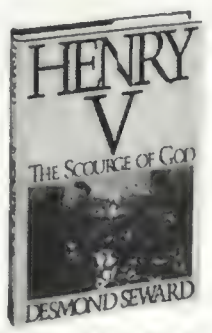

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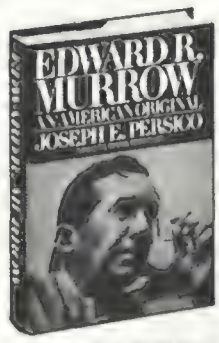

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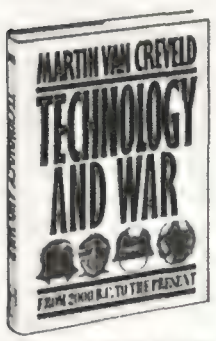

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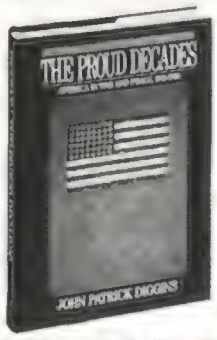

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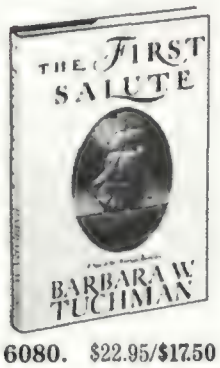

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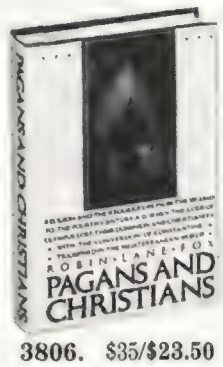

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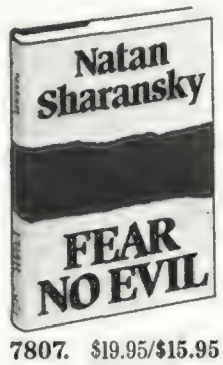

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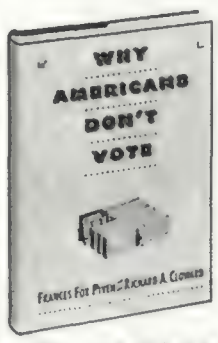

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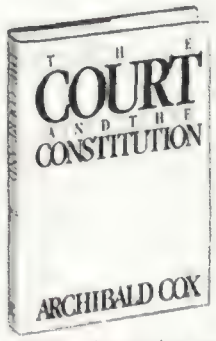

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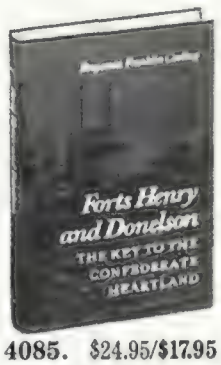

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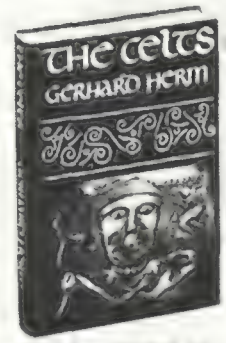

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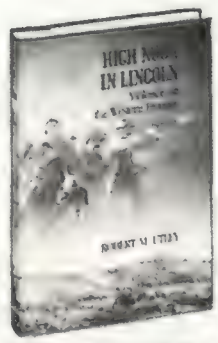

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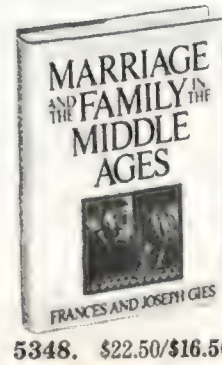

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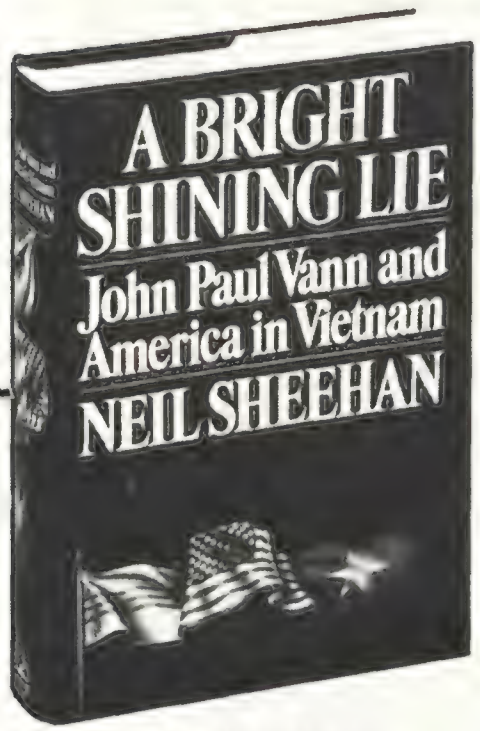

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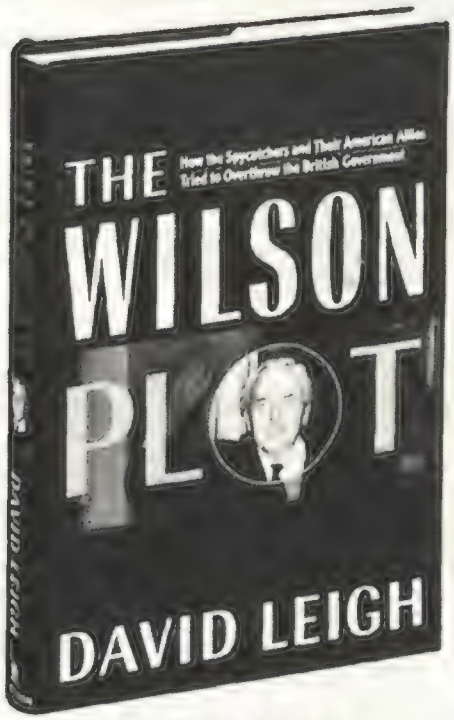

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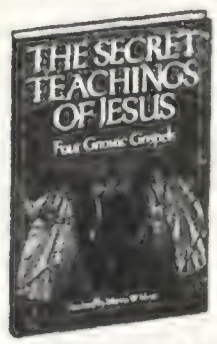

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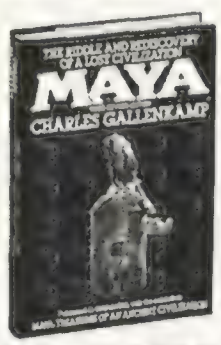

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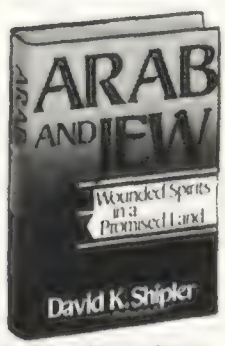

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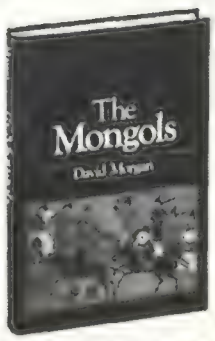

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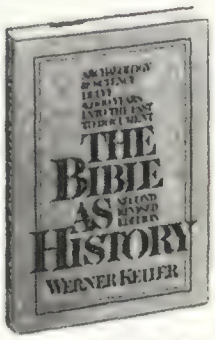

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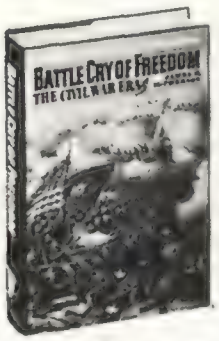

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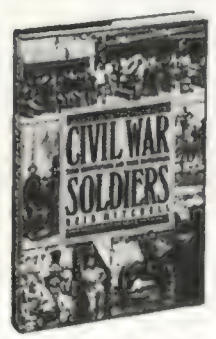

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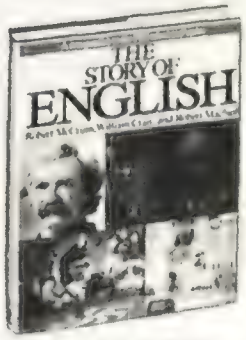

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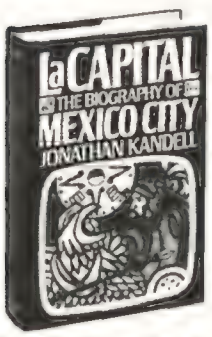

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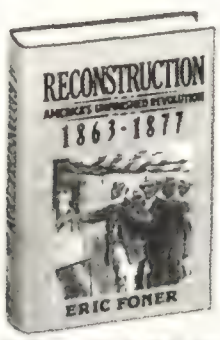

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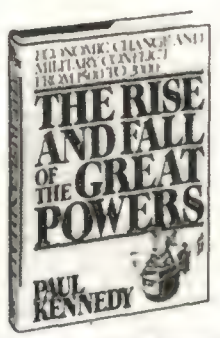

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Egyptian tomb reliefs indicate that a pharaonic version of the IRS had come into being by 2500 B.C.

By Lionel Casson

Think that taxes take a big bite today?

Think again. The IRS is lax and lenient compared with the merciless collectors who shook folks down for the pharaohs

Everybody knows what Ben Franklin said about death and taxes. But hardly anybody realizes just how long the scourge of taxes has been with us—and how diabolical tax collecting used to be.

In ancient Egypt the wealthy were buried in elaborate tombs decorated with scenes of what had gone on in their daily existence, the presumption being that the deceased happily faced more of the same in the afterlife. From these it is clear that a pharaonic version of the IRS existed by the middle of the third millennium B.C., challenging the Egyptian belief that you *could* take it with you.

A tomb dating to around 2400 B.C. has a series of reliefs showing the contemporary tax system in action. One scene presents an official sentencing a lineup of tax delinquents. In the next, some unfortunate malefactors are enduring one of the standard punishments—

This sadly called into question the Egyptian belief that you *could* take it all with you.

flogging. Egyptians were born bookkeepers, so the pharaohs' investigators were able to check up on taxpayers the same way the IRS does today, through records of property and income. Tomb pictures of harvesting include clerks squatting off to the side, with reed pen in hand to list the size of the crop. There were clerks in the cellars to record beer inventories, clerks in the slaughterhouses to record the cuts from carcasses, clerks in the workshops to record materials, and so on. Thanks to the dry climate, samples of what the clerks wrote down have survived to this day.

In ancient times, along the marshy stretches of the Nile, the papyrus plant, a tall, slender reed, grew in profusion. Around 3000 B.C., perhaps even earlier, Egyptians learned to make a first-rate writing material from it. They split the stem into strips and laid these flat alongside each other, one layer vertically with a second superimposed horizontally, and then pressed the whole, causing the natural gummy substance in the cell sap of the plant to bond the strips and layers together. This produced the nearest thing to paper that the ancient world had. In fact, our word "paper" comes from *papyros*, the Greek name for the plant.

Papyrus was light and strong, with a surface smooth enough to take perfectly the ink of lampblack and water that was then in use. It was more practicable by far than the clay tablets of the Assyrians, Babylonians and other nations farther to the east. For the Egyptians, papyrus served all the purposes paper does today and, since they eventually exported it the length and breadth of the Mediterranean, it served the rest of the ancient world as well. In all the many Egyptian tomb scenes where clerks are shown writing, they are recording their facts and figures on rolls of papyrus.

Illustrations by Arnold Roth

And all the world shall be taxed

Modern Egypt is a kind of paradise for archaeologists. Parts get hardly any rain, and there even fragile objects like papyrus-paper documents can survive for millennia. Multitudes of them have been unearthed, the ink often as black as the day they were written. Some date from the age of the pharaohs, but the greatest number are from the centuries after 300 B.C., in the times of the first of the 15 Ptolemies. This was the start of Egypt's foreign domination, first by a Greek dynasty and then by the Roman emperors.

The emperors in particular were flinthearted taxers, and the papyrus documents of the time, mostly written in Greek, which had become the official language of Egypt, reveal that for the inhabitants of the valley of the Nile nothing in life was more certain than the taxes they had to pay. The tax bureaus of the Romans, with their reed pens and papyrus scrolls, were a match for the IRS with all its electronic gear. They had every taxpayer, present and potential, down on the books. They taxed everything they could think of. And they collected with ruthless efficiency.

Copies of certificates such as this one show that all births were registered:

> To . . . the clerks of the metropolis, from Ischyras . . . and his wife Thaisarion. . . . We hereby register the son, Ischyras, born to us and being one year of age in the present 14th year of the emperor Antoninus Caesar [A.D. 150 or 151].

The government, in other words, collected potential taxpayers' names at the starting gun, as it were. There was also something called the "house-by-house registration," a kind of financial census that caught everybody in its meshes and kept them there for life: each house owner or landlord furnished a detailed list of all occupants, including parentage, age, profession, tax status and indication of the property they owned. Here are some sample lines from one drawn up in A.D. 189:

The tax rolls were kept up to date and every parcel of land had to be listed. The animal registry caught all cattle and sheep. There was even a special tax on pigs.

A poll tax was levied on males; a house-by-house registration tipped off the tax clerks on exactly when each boy came of age. Those who failed to register could be fined 25 percent of their personal property.

> To the district head . . . from Achilles. . . . I own a share of a house . . . for which I hereby register the following occupants for the house-by-house registration. . . : Heracleia, wife of Pasigenes, daughter of Cronion and ex-slave of Didymus . . ., age 40. Thasis, daughter . . ., age 5. Sabinus, son of Heracleia and Sabinus [Heracleia's first husband] . . ., subject to poll tax, wool carder, age 18. Sarapias, daughter of Heracleia, age 22, wife of Eutyches. . . . Tapesouris, daughter of Isidora, age 18. . . . Tapesouris owns in the Moeris quarter a sixth share of a house inherited from her mother.

The town and village clerks saw to it that the rolls were kept up to date. Of course, there was also a land registration that caught all farms and orchards. Each parcel was listed with its size (certified by an official survey—the authorities took no chances), its quality, the nature and likely value of its crop (grain, wine, olive oil, etc.). There was an animal registry that caught all cattle, sheep, pigs and such, since there was a tax on every head. Every craftsman and tradesman had to register, since each had to pay a trade or craft tax. Even transients were put on the record books, including prostitutes. The record has survived of one, aptly named Aphrodite, who got a one-day permit "to go to bed with whomever you wish on this date." Add poll tax on males ages 14 to 60 (the house-by-house registration tipped off the tax clerks as to exactly when each boy became subject—or, 46 years later, if he lived that long, finally became exempt). There was even a special tax on pigs, nobody knows why. Probably for sacrifices.

The tax office shelves groaned under the load of ledgers. A chunk of one that covers a mere village's taxes for a mere three years has survived; as the editor wearily observed, it is almost as long as the *Iliad*. Each taxpayer was issued a receipt for each tax paid—and here we come to the most unkindest cut of all: he had to supply his own writing material. It's as if we not only had to make out a check to the IRS, but also had to get up our own copy of Form 1040. Since tax receipts could amount to a respectable number of pieces of papyrus, most taxpayers saved themselves the cost of paper by scribbling on chunks of broken pottery instead.

Classicist Lionel Casson writes often for us on the doings of the ancient world. Among his subjects: political campaigns in Rome; how lawyering began.

The tax bureaus of the Ptolemies and of the Romans, with their reed pens and papyrus scrolls, taxed anything they could think of. Above all, the revenue collectors collected with ruthless efficiency.

Failure to pay brought stiff penalties. If you didn't turn in your house-by-house registration it might cost you one-fourth of your personal property. And if there were no longer any floggings, as in the days of the pharaohs, Roman tax officials had their own hard-nosed way of insuring compliance. Here, for example, is the text of a petition for redress that some poor farmer submitted in A.D. 193 to the authorities of his district (in the modern Fayoum):

> I and my brother delivered . . . nine of the ten artabs [of grain] specially levied on us. . . . Now, on account of the one remaining artab, the grain-tax collectors . . . and their clerk . . . as well as their assistant broke into my house while I was out in the field . . . and tore off my mother's cloak and threw her to the ground. As a result she was bedridden. . . . I ask that they be summoned before you so that I may obtain justice.

The Roman government did not do its own tax collecting. Instead, it used an easy, cheap, diabolical but seemingly foolproof system: it appointed well-heeled locals in every area as collectors, with the understanding that if there were a shortfall it had to be made up out of their own pockets. In practice, the system proved foolproof only when times were good. Some years the crops would fail and payments would fall into arrears. The collectors, in order to save their own financial skins, would put the screws on the taxpayers who, when squeezed dry, would simply take to their heels. Their names remained indelibly on the lists, but they were no longer there to answer to them. Roman officials would then put the screws on the collectors, and they would do the only thing they could—make an appeal to the higher-ups.

A document has survived, written around A.D. 55, in which the collectors of six tiny villages turn to no less a personage than the governor of Egypt himself. After giving their names and the names of their villages, they add dolefully:

> The inhabitants of the aforesaid villages, hitherto numerous, have now dwindled to a few since some, reduced to poverty, have run away, and others have died without heirs. For this reason we are in danger, because of lack of resources, of giving up our office. Wherefore we turn to you and ask of you, the savior and benefactor of all, that you please write to the head of our district . . . to protect us from harassment.

Eventually the government would find itself obliged to grant an amnesty and cancel the arrears, the taxpayers would troop back home, things would go along well enough—until the next bad spell, when the cycle started all over again.

"And it came to pass in those days," says the Gospel according to Luke, "that there went out a decree from Caesar Augustus, that all the world should be taxed." It sure was.

Even transients—including prostitutes—were put on the city tax rolls and vigorously shaken down.

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The Kashmir Goat:

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By Israel Shenker

From the villages of Stoke-on-Trent, a river of china

The 18th century's Josiah Wedgwood, eccentric extraordinaire, and others founded enduring dynasties whose pottery today circles the globe

Coalport, established in 1795, is noted for elaborate ornamental pieces such as this bowl of delicate flowers.

Strung higgledy-piggledy along a seven-mile confusion of roads, England's Stoke-on-Trent, a city known as The Potteries, has a quarter-million people in six towns—Tunstall, Burslem, Hanley, Stoke-upon-Trent, Longton and Fenton—each with its own town hall. The city is also called The Five Towns, since native son Arnold Bennett, who wrote about it, left out Fenton: his mother-in-law lived there. I had no such prejudice—my mother-in-law never lived in Fenton—and my china chase touched every base.

Without The Five Towns, Bennett noted, you cannot drink tea from a teacup or eat a decent meal. When a housewife drops a plate, that brings work to The Potteries. "The horse is less to the Arab than clay is to the [Stoke] man," Bennett wrote. "He exists in it and by it: it fills his lungs and blanches his cheek; it keeps him alive and it kills him."

There is lush china, chaste china, china redolent of Ming, of distant Japan, of courtly France, china adorned with Italian landscapes, china for royal occasions, for stately banquets, for the everyday pleasures of the table. Here are memorials to the pioneers of china, rich museums of china, china for every bright or solemn occasion from the china cradle to the graven china tombstone.

The only potter still using barges, Johnson Brothers moves biscuit from kiln to be decorated and refired.

My chase began at the Stoke train station. Right inside the station is the Potteries Centre, offering wares of many potteries, even from Limoges, which is twinned with Stoke. Opposite the station is a statue of Josiah Wedgwood, last of 12 children, a fifth-generation potter born in 1730. His declared ambition was to be "Vase Maker General to the Universe," and in a life devoted to experiment and enterprise he came pretty close. Wedgwood developed a cream-colored earthenware that was a match for Europe's porcelain, and that—with Queen Charlotte's permission—became known as Queen's Ware. Ever searching for superior raw materials, he even tried clay that the Cherokee Indians used for their pipes. With black furnished by water drained from coal mines, he produced a smooth, hard Black Basalt ideal for urns, vases, teaware and statuary. After 4,000 trials he made Jasper, an unglazed vitreous stoneware that could be stained in numerous colors as background for white classical reliefs. And for his contributions, Josiah was made a fellow of the Royal Society.

Avid to increase the firm's renown, he employed prestigious artists and solicited aristocratic patronage. For Russia's Catherine the Great he made a service of 952 pieces decorated with freehand paintings of 1,244 English scenes. He issued portrait medallions of famous contemporaries: Benjamin Franklin, George III, Louis XVI. During the Revolutionary War, Josiah I prepared medallions of George Washington and circumspectly referred to him in correspondence as the

Photographs by Bryan and Cherry Alexander

Grand Duke of Muscovy. He produced a stunning copy of the celebrated 1,800-year-old Portland Vase, and when a drunk smashed the original in 1845 it was glued back together with the help of a copy that had been made by Wedgwood.

Back in 1448, when potters were probably already thick on the ground, two brothers—William and Richard Adams—were fined for digging clay from the road. (Well-trodden clay is superior raw material.) By tradition, it was after his horse fell into a pothole that Josiah I had his right leg amputated. With typical foresightedness he acquired spare wooden legs, hinged at knee and ankle, and with typical absentmindedness he left spares behind in coaches. His legacy was substantial: production on the basis of specialized labor; a canal of 93 miles and 75 locks to link the Trent and Mersey rivers and drastically cut shipping costs; world fame and distinguished progeny. One grandson was Charles Darwin, whose father let him go on the *Beagle*—a voyage that led to the theory of evolution—after persuasion by Darwin's uncle, Josiah II. With dubious natural selection, Charles married his first cousin Emma Wedgwood, and his sister Caroline Darwin married Josiah III.

Today Wedgwood employs 6,500, with a dozen factories in the Stoke area. Over the years it has collected a host of subsidiaries, including Mason's, known for rich colors and oriental patterns as well as the ironstone once used for big pieces such as four-posters and garden seats; and Coalport, specialist in china flowers. In 1986, Wedgwood itself succumbed to a takeover by Ireland's Waterford; thanks to the renown of its name, Wedgwood's identity is kept crystal-clear. Last year 170,000 came to Wedgwood's Visitor Centre, where potters demonstrate their skills and where two shops—stylish for top quality, not-so-stylish for seconds—sell Wedgwood china. There is also a museum rich in artifacts of Josiah I: specimens of his Jasper experiments, lovely examples of early Wedgwood, portraits of the family's dynastic worthies by Reynolds, Stubbs, Romney and Sargent.

Charles Dickens and the blacking bottles

Wedgwood supplies china for the House of Commons, Royal Doulton supplies it for the House of Lords. Founder John Doulton was born in 1793, two years before the death of Wedgwood's Josiah I. His pottery produced stoneware bottles, brown mugs, and jugs depicting Nelson, Wellington and Napoleon. (As a laboring child, Charles Dickens pasted labels on thousands of Doulton blacking bottles.)

John's son Henry, who became known as the Big Potter, set up a factory pioneering stoneware drainpipes. Beneath the streets of many British cities gurgle

Napoleon Ivy by Wedgwood is still popular, 174 years after the exiled emperor dined on a set at St. Helena.

Working from customer's photograph, a Minton artist paints likeness of beloved pets on plate before firing.

Queen Victoria figurine by Doulton is lissome young woman, not usual "dumpy, ugly Widow of Windsor."

Portrait busts like this of Ronald Reagan, held by sculpture chief Eric Griffiths, are a Doulton specialty.

miles of 19th-century Doulton pipes, and sanitary advances owe much to Henry's missionary zeal. Having made his fortune from pipes, the Big Potter was persuaded to take an interest in decorative stoneware and embarked on a splendid career as patron of pottery artists. For services to ceramic art and science, he was the first potter to be knighted.

Encouragement of art remains a company tradition. Two years ago, Royal Doulton set up the Sir Henry Doulton School of Sculpture. Students are supported while they study fundamentals, including anatomy taught by the company doctor. They have no obligation to work for Doulton, but two from this first class are joining the company and one student is going to fashion wax figures at Madame Tussaud's.

Unassertive brides, adventurous matrons

Royal Doulton, employing 7,500 workers, has amassed its own cluster of distinguished potting subsidiaries, including Minton, Royal Crown Derby, Royal Albert, John Beswick and Royal Adderley. The group makes more than 40,000 different items, including a sheep's-head platter for the Arab trade. Dinnerware design is more exacting than one might think. "The shape of the cup is absolutely critical," says art director Jo Ledger. Potters refer to the major American markets as "bridal" and "matron." Brides usually opt for unassertive, mainly white, china, reflecting what Leger calls "immaturity of taste." After the children have come and gone, matrons seek a more adventurous—colorful yet classic—traditional style.

The company also does a brisk trade with Japan, ships china to China for Western-run hotels and is preparing to sell china in the Soviet Union through a new, duty-free establishment.

"We're providing what people want, and they don't want to be reminded of sadness," notes Eric J. Griffiths, Doulton's chief of sculpture. "One of my modelers, who comes from a miner's family in Wales, did a lovely figure of a miner who had come out of the pit and was feeding a little bird. But who wants to be reminded of men who go down into the bowels of the Earth? There's enough harsh reality in the world. We think in terms of peace, motherhood, jollity, charm, the broad words, the good words. We did three figures called Faith, Hope and Charity. Why did Hope sell more than Faith and Charity? The answer was that Hope had bare feet and the others didn't. Hope was more in need of people's love than Faith and Charity. People want shepherds, they want fishermen, they want knights in armor."

Griffiths also produced the Femme Fatale series (Cleopatra, Salome, Eve), bringing the factory welcome toil for the vamps of china. For the Republican

Stoke-on-Trent is awash in museums showing china and historical documents from its profusion of potteries. They range from pattern books of some early masters to these Victorian toilet bowls seen at the Gladstone.

Party he did a portrait jug of former President Reagan. The President's daughter Maureen complained there wasn't a single wrinkle. Griffiths obliged.

Beswick has been doing Beatrix Potter figures (SMITHSONIAN, January 1989) for more than 40 years, and now Winnie the Pooh as well. At Royal Adderley, 80 flower makers deftly fashion china botany by hand—rose, carnation, anemone, daisy, buttercup, forget-me-not—singly and in whole bouquets.

Thomas Minton, born in 1765, founded the company that became celebrated as a designer's house, its products characterized by strong colors. The company has also gone out of its way to be loyal to Crown and country. Its museum exhibits Minton china in the Balmoral tartan designed by Prince Albert, and the Minton Rose pattern has been selling now for 150 years. They will even oblige with hand-painted reproductions of photographs sent by clients—pets, cottages, landscapes, cars, yachts, planes; in the United States an eight-inch plate sells for $900. For the Sultan of Brunei, Minton has been producing a Shrewsbury Green service encrusted with raised gold. A ten-inch dinner plate takes a week to gild and in this country would cost $10,800. Shrewsbury will be the Sultan's second-best dinner service, but Minton is not put out. The first best is solid gold.

In a potbank, or factory, that has stayed put more than two centuries and flanks the Stoke town hall, Spode is meanwhile busy on a 7,500-piece banquet service for the Sultan—or perhaps for his servants, since the cost of a ten-inch dinner plate will be bargain basement, about £100 ($180). Spode has also produced a plate for the Conservative Party, showing No. 10 Downing Street, Chequers, Big Ben and—smack in the center—Margaret Thatcher. One company artist specializes in maritime scenes. For the American market he did a series on the War of 1812. Four victories for the United States, only two for the home side.

The founding father, Josiah Spode, born in 1733, was 7 when he went to work at a local pottery. His employer promised two shillings sixpence a week "if he deserves it." Spode brought steam power to pottery

Mr. Shenker's 1988 SMITHSONIAN *articles were on artists Edgar Degas and Giacometti, and on Legoland Park in Denmark; in 1987 he wrote about Marks & Spencer.*

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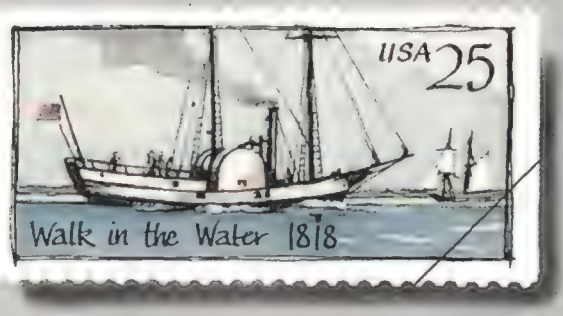

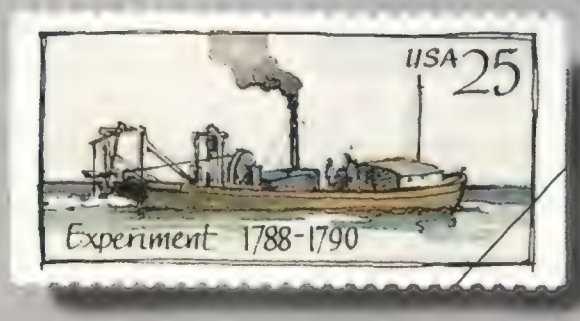

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and pioneered the development of bone china, the variety that became Britain's specialty. The Spode Museum has preserved a valuable collection, including a superb leg bath and a stunning bidet.

By the end of the 18th century, Stoke's potters were using superior china clay and china stone from Cornwall. China clay (kaolin) is the whitest clay known; china stone (petuntse) is—like china clay—decomposed granite, but at an earlier stage of decomposition. A mix of about 25 percent china clay, 25 percent china stone and 50 percent bone is the basis of bone china. The bone is from oxen or cattle and is calcined to a fine ash; it lends whiteness, translucency and strength. Bones of Argentine oxen have proved popular. Indian ox bones contain too much iron; horse bones are too spongy.

Pottery came to Stoke because of the presence of raw materials: clay for earthenware, coal to heat the kilns and, not far away, lead and salt for glazing. Two futures beckoned youngsters growing up in The Potteries: the pits or the pots. Children who avoided coal mines worked 12-hour days in potteries, where survival was also beset with perils. Pestilential smoke poured from huge bottle-shaped kilns, poisonous arsenic was used in painting and lead in glazing, and workers fell victim to potter's rot, a debilitating disease of the lungs.

Handsome cobblestone pavement winds among retired bottle kilns now housing Stoke's Gladstone Museum.

In the potteries, crushed clay in water was blunged—laboriously stirred by hand with huge paddles. The traditional method of forming pots was by throwing—shaping clay by hand on a potter's wheel. Increasingly, potters cast their ware in plaster-of-paris molds, a technique still in wide use. A worker pours slip, or liquid clay, into the moisture-absorbent mold and pours off the excess; the clay form shrinks as it dries and can then be removed.

Another innovation was the jolly—a machine for making cups, tureens and bowls. It has a forming tool that descends into the clay inside a rotating mold, pressing the clay against the mold. Here and there, machines have now been introduced that automatically pour slip into molds and turn out hollowware forms, one machine replacing ten men. These days, throwing is reserved for demonstrations.

To form plates, a ball of wet clay is flattened into a pancake or "bat" and slapped onto a horizontal, rotating plaster mold that's the shape of the inside of the plate. A horizontal jig with a mold of the plate's back is then lowered onto the bat. At some factories, a huge machine now produces plates by granulate-pressing—squeezing clay granulates from dried slip into a compact, homogeneous mass.

Potters sans eyebrows, sans eyelashes

In past centuries, dried clay forms were placed inside refractory containers called saggers, which were then stacked atop one another, 2,000 in each bottle kiln. The doorway was then bricked up, with a peephole left for the man in charge of firing the clay. He judged temperature by the color of the flame and often stayed at his post during the 72 hours of the crucial first firing, at about 1,200 degrees C. To get maximum use out of the kilns after firing, workers were required to remove the saggers while the oven was still hot—and those who hesitated feared for their jobs. Kiln workers suffered from dehydration, and most had their eyebrows and eyelashes singed off.

Today the bottle kiln is but a relic; now kilns come in a humane variety, such as the 100-yard-long tunnel in which about 50 trolleys on rails, with platforms bearing forms in dry, chalk-white clay for firing, move forward automatically. Eyebrows and eyelashes are back. With kilns now fired by electricity or natural gas, the skies above Stoke are clear. Thanks to factory dust extractors and a ban on lead, the respiratory ailments

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Smashing pottery may be world's most satisfying job. Minton's Sam Harwood dispatches substandard ware.

have declined and potter's rot has disappeared entirely.

After a first firing, the ware—now known as biscuit—can be decorated either under or over the glaze. Underglaze decoration is usually done by transfer printing, after which the biscuit returns to the kiln for a second firing, at perhaps 800 degrees C, to harden the color and get rid of oils. The ware is then ready to be dipped in glaze—an opaque liquid of creamy consistency, a sort of liquid glass produced when clay and flint are finely ground and mixed with water. Next the ware is fired for about 30 hours. Another firing at a lower temperature allows more-brilliant colors to be applied over the glaze. Depending on the number and nature of colors, the ware may require numerous additional firings at different temperatures. Obtaining a desired color is tricky. Red, for example, may require orange paint and pink atop that; if red is applied directly it may emerge from the kiln a dirty gray. Gilding—22 carat—is usually done by hand; after firing it can be scoured with fine silver sand and burnished with bloodstone. Sultan please note: gilding does not take kindly to microwave ovens.

A dozen Stoke-on-Trent potteries offer factory visits, and there are two dozen factory shops, in addition to a large number of independent establishments, usually selling top of the line as well as seconds. The City Museum and Art Gallery has a comprehensive ceramic collection, and the Gladstone Pottery Museum offers the charm of the venerable in a Victorian potbank rescued from demolition, complete with bottle kilns and demonstrations of potting. Also enticing: a store called the China Cave, and Johnson Brothers Bull in a China Shop, to say nothing of arch references to fusspots and people absolutely potty about—pots. Notes Doulton's Ann Linscott: "You change your furnishings, wallpaper, furniture, but china remains special."

I remember, many years ago, my disdain when I saw cabinets full of china cows collected by the wife of the American ambassador to The Hague. The laugh was on me when my wife became a "pocillovist"—collecting eggcups. On my fourth morning in Stoke, after a hearty breakfast on sturdy hotelware, I set off on the last lap, an eggcup chase to surprise my wife with new recruits. Without rushing, with time for coffee at the Gladstone, and without surrendering to every candidate in my path, I did 12 factory shops in three hours and came away with 29 eggcups to gratify the domestic appetite. This achievement will not survive a determined assault, but until the *Guinness Book of World Records* hears from anyone else, that's it for now.

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By Dora Jane Hamblin

A white marble city that an emperor chose for his own

Eventually the city of Aphrodisias fell to ruin; now its elegant monuments and sculpture are being restored and reerected by archaeologists

One Theodoros, c. 2d century A.D., dedicated this bust of Aphrodite to adorn the Theatre's stage facade.

Most field archaeologists spend endless hours sifting tons of debris in search of a fragment of pottery, a bit of inscription, a section of defense wall or the stone outlines of human habitation.

Not so one of the world's most fortunate diggers, who has found exquisite marble heads tumbling out of drainage ditches practically into his lap; one-ton marble panels, five or six feet high, lying about amid the drums of fallen fluted marble columns; and who has all but tripped over inscriptions as he strode through the weeds of his 250-acre site.

He is Kenan T. Erim of New York University, who, since 1961, has directed an international crew on the ancient site of Aphrodisias, a Greco-Roman city in southwestern Turkey. Their finds have already overflowed an on-site museum opened only ten years ago. At Aphrodisias "an embarrassment of riches" is not hyperbole but fact: now the compound that houses the director and key members of his staff is also overflowing, its walled garden a neat, open-air storehouse of gods and goddesses, Roman emperors, centaurs, scenes from Greek mythology, Trojan heroes and numerous representations of the Greek goddess Aphrodite, for whom the ancient city was named. Though she is often perceived in the West as solely the goddess of love, Aphrodite symbolized both fertility and life, and reigned supreme over Heaven and Earth.

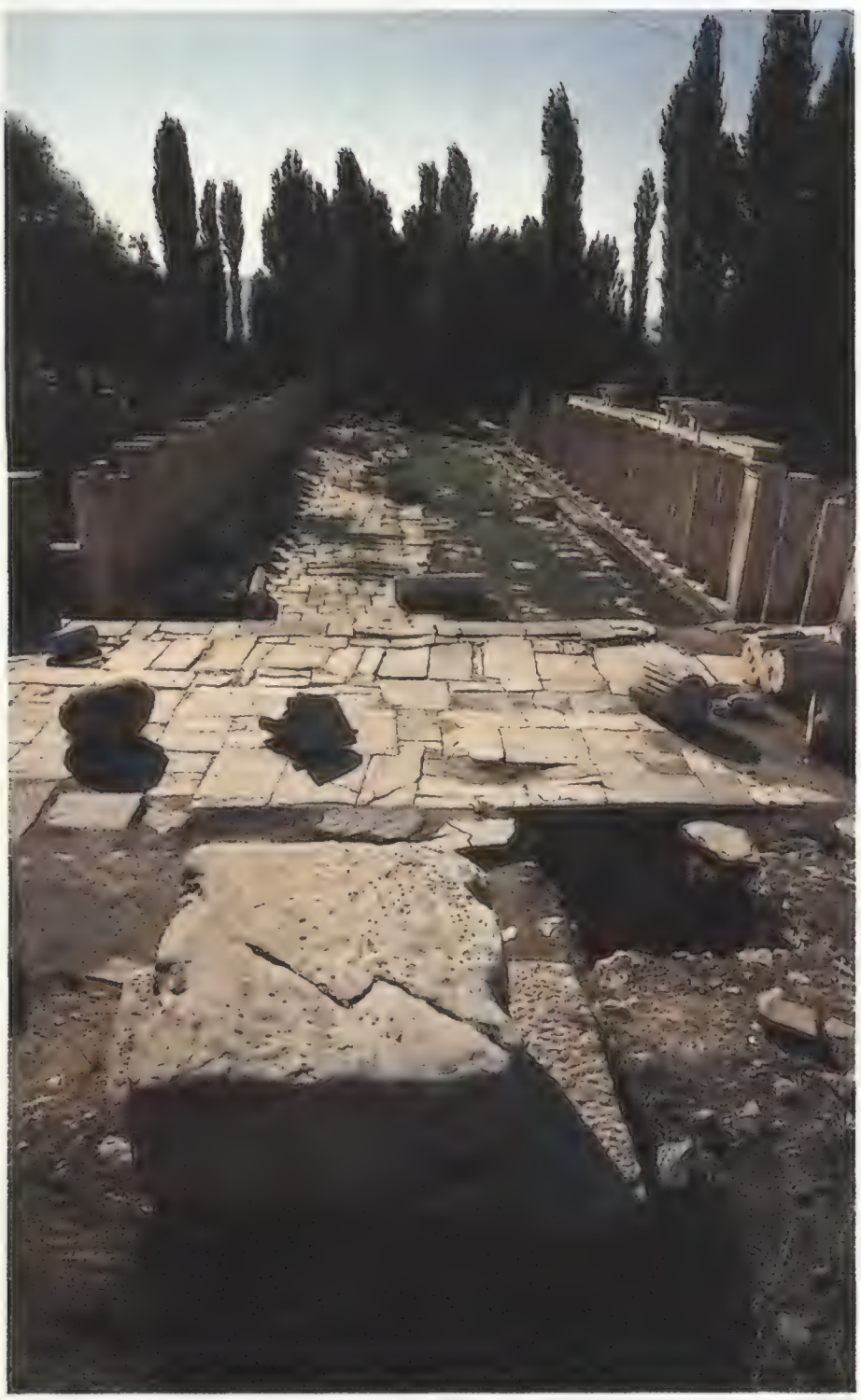
Ionic friezes from the Agora Gate await reerection. In foreground is Dionysus, god of ecstasy and wine.

The goddess would be hard put to select for herself a site more beguiling than the one her worshipers did. Aphrodisias lay about 2,000 feet above sea level on a plain partially ringed by mountains, dominated by towering, cloud-swept Baba Dağ (Father Mountain), and watered by a dozen streams and springs. Nearby was the Maeander River, so wayward that it gave us the word "meander"; today it is called the Menderes. The fertile plain provided rich harvests of olives, grapes, figs, grains. Tall poplars and gnarled oaks and great, spreading plane trees gave shade in summer.

When Erim first saw the site in 1959, a ragtag Turkish village called Geyre lay on top of much of old Aphrodisias. Baba Dağ and the poplar trees remained, and 14 gleaming columns of the Temple of Aphrodite. Off to the north lay remains of an enormous stadium,

Photographs by Ara Güler

Aphrodisias, the white marble city



The first-story colonnades of Sebasteion porticoes, now reerected, once flanked a processional way (center).

one of the best preserved in all the Mediterranean world, whose 30 tiers of seats once held 30,000 spectators. At about the center of the site rose a hill that early explorers had described as the Acropolis.

As the sun struck through the poplar groves it threw back glints of pure white, bouncing from tumbled marble columns lying about in the weeds. Peasants used marble sarcophagi to trample out their grapes for wine or for the much-loved grape jelly called *pekmez.* When Erim pointed out the true use of the sarcophagi the men scoffed: there were bas-relief renditions of vines and bunches of grapes on the sides of many of the sarcophagi and, after all, what could be a clearer indication of their intended function? Corinthian capitals and column drums propped up sagging wooden porches or were embedded in house walls. Others served as card tables for loiterers in the village square. Sheep, goats, chickens and children wandered among the fallen fragments and the tangled fig trees. Frogs croaked at night from silent pools created centuries ago when earthquakes shattered Roman water pipes and plumbing.

There, in a drainage ditch—Aphrodite!

From this colorful chaos the archaeologists and cooperating Turkish authorities have cleared almost all of the houses of the village, and resettled its residents a mile or so away. They have uncovered, in addition to the stunning decorative elements, enormous baths and markets, elaborate Roman residences, streets, sculptors' workshops and all the grand accouterments of a rich Roman city.

"It began that very first summer of excavation," Erim recalls. "I looked down into a drainage ditch the villagers had started to dig five years before, and suddenly found myself staring straight into the face of a marble head. A member of my staff lifted it out. It was beautiful, a woman's head with a broken nose and a curious headdress like a tiara, but with sculptured shapes of towers and city walls crowning it. This could mean only one thing—that she was the personification of the city itself. She was Aphrodite. I took her over to the storeroom, where Turkish authorities had put things found accidentally at the site. I had this nagging memory of a headless relief in there, and when I lifted up my lady and put her on top of the neck, she was a perfect fit.

"There was another miracle that day. Latif, the watchman, was scrambling around in some boxes of fragments and pretty soon he came out carrying a piece of marble with traces of Greek letters. He fitted it precisely into the side of the statue. The inscription: *Polis*—the City. It was a sign. Aphrodisias was ours."

On the final day of a season's dig nine years later,

Ionic columns in background were part of Temple of Aphrodite. Later, Corinthian columns (foreground) enclosed Temple's temenos, or sacred precinct. In 5th century A.D. complex became a Christian basilica.

Erim and his workmen turned up a big, idealized head in the ruins of the Theatre and in examining it realized that it represented *Demos*—the People.

"On my very first day I found the City, and on the last day of the tenth season we found the People," he says with a mixture of wonder and triumph.

But that was not all. In late summer of that year the Aphrodisias diggers read their morning papers with some dismay: they learned that the prime minister had just announced a devaluation of the Turkish currency to combat inflation.

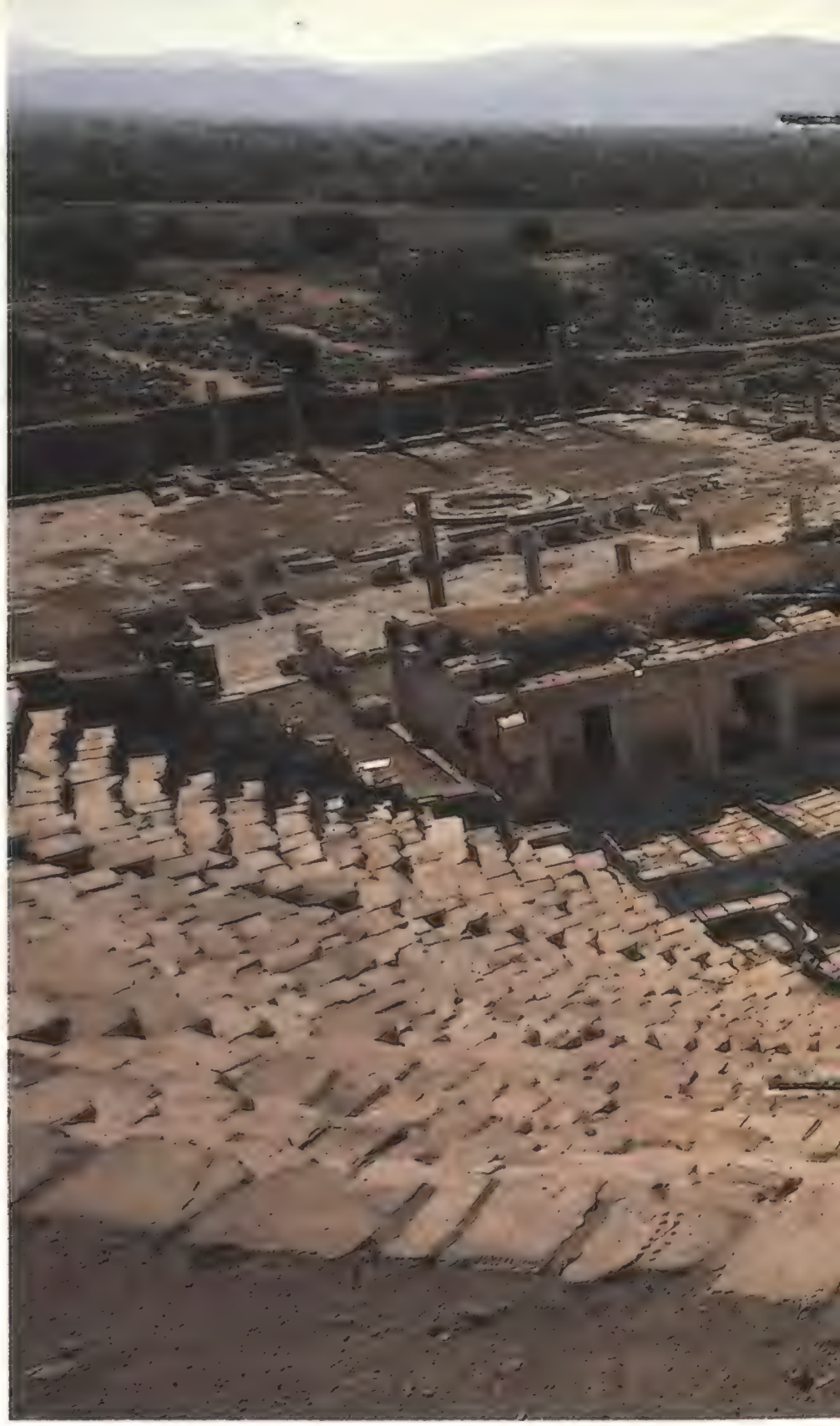
That same week, fragments of an ancient edict were unearthed, and as the archaeologists pieced them together they dubbed it the "currency edict." In A.D. 301, the emperor Diocletian had issued a proclamation denouncing merchants as "avaricious" and establishing rigid price controls on practically everything for sale in the Empire. This new find, a companion piece to Diocletian's price edict, had to do with devaluation of the currency. Even archaeologists can get the giggles, and several did as they reflected that *nihil novi sub sole*, there is nothing new under the sun.

Erim has also found much of the tangled history of Aphrodisias. First of all, the Acropolis was not an acropolis at all but rather a *höyük*, or tell, a mound made up of the debris of mud-brick settlement upon settlement, rising century by century as houses collapsed or were destroyed. Patient excavation of the *höyük* turned up not only a magnificent marble theater that could accommodate 8,000 spectators, but also a wealth of stone tool fragments, obsidian flakes, figurines, animal bones. Sophisticated radiocarbon analysis of artifacts from an adjacent mound indicates that people inhabited this place as early as 5800 B.C.; there is evidence of continuous habitation from about the third millennium B.C., and of an archaic shrine from the sixth century B.C. Greek influence, which may have existed even before the Persians conquered the general region around 546 B.C., increased after Alexander the Great drove them out two centuries later. The shrine's goddess, originally a native divinity, was later associated with the Akkadian Nin, or the Mesopotamian Ishtar or

Aphrodisias' beauty stunned the author on her first visit in 1970, when the only discernible structures were the Baths of Hadrian, Stadium, Temple and Odeon.

In his headquarters garden, Kenan Erim stands before mythological and imperial reliefs from Sebasteion.

Nathalie de Chaisemartin guides workmen rejoining part of an Ionic frieze from the Theatre's stage facade.



The Theatre's lower tier, among finest classical remains in Turkey, was excavated virtually intact.

Astarte, and eventually became Aphrodite. And so the site by the second or first century B.C. became Aphrodisias. The Temple of Aphrodite probably rose in the first century B.C. Still, neither the early settlers nor the Greeks founded a true city. There was only a sacred site staffed by priests or attendants of some kind, with such buildings and workers as necessary to feed and support both priests and visitors.

It became a true city only when the Romans moved to take over western Asia in late Hellenistic times. The name Aphrodisias suited them just fine because they claimed descent from Aeneas of Troy, who was the son of Venus, the Roman version of Aphrodite. By the time the Roman general Sulla appeared on the scene in the first century B.C., the temple and cult of Aphrodite were so renowned that he gave a golden crown and a double ax as offerings to the goddess in her temple.

Roman favor grew even greater after the murder of Julius Caesar in 44 B.C. A triumvirate ruled the Roman world, and one of its members was Octavian, who was to be the emperor Augustus. Octavian proclaimed that "Aphrodisias is the one city from all of Asia I have selected to be my own." In 1969 a team excavating the north wall of the Theatre stage building came upon these very words inscribed in Greek. Now known as the "Archive Wall," this astonishing marble document records messages from Roman emperors from the first century B.C. to the third A.D., all paying tribute, pledg-

Upper rows were razed after 7th century A.D. for a Byzantine fortress. The circular area (top left) was the center of a 4th-century A.D. market that was surrounded by porticoes; to its right, Theatre Baths.

ing support or otherwise referring to Aphrodisias.

This friendship, and the city's continuing loyalty to Rome, earned its citizens a priceless privilege: exemption from imperial taxation (see page 122). Tax-free status helped the city flourish, as did its growing fame as a place of religious pilgrimage. But most important of all was Baba Dağ and its marble. Marble truly made the city, not only its monuments but, more than that, its fame and its wealth. For the marble of Baba Dağ was wondrous in quality and quantity. And it lay conveniently nearby. Some was milky white, some bluish gray, some veined, and of such composition that an expert could cut a chunk containing various colors and make, for example, a dark blue bull surmounted by a white rider, all in one piece. It could be soft-polished on one section, rasped on another, to create dramatic contrast. And it took and held tiny details like fingernails, eyelids, nostrils, drapery, exquisitely.

Very early the fame of the Aphrodisian sculptors spread around the Mediterranean. Wealthy Romans ordered sarcophagi, and busts and statues to decorate their lavish villas back home. Many cities also ordered marble works from Aphrodisias, and visitors to Aphrodite's shrine were dazzled by examples of the sculptor's art. By the second century A.D. it was one of the richest and most famous cities of all Asia Minor, with a resident population of 50,000 to 60,000 and a steady stream of pilgrims and travelers.

The Stadium, almost as long as three football fields, is c. 1st century A.D.; later on, circuses were held at far end. In the distance can be seen Baba Dağ, or Father Mountain, which was source of Aphrodisias' marble.

Its citizens could stroll through tree-shaded, marble-paved streets to the great baths of the Theatre or to the even more sumptuous baths dedicated to the peripatetic Hadrian. For entertainment the elite probably patronized the exquisite little 1,000-seat Odeon, rows of elegantly curved marble seats facing a mosaic-floored orchestra and a stage with a backdrop of niches holding statues of poets and philosophers, high officials and members of imperial Roman families. There were concerts here, and dance, pantomimes and lectures. Aphrodisias boasted schools of philosophy and oratory, and no doubt some of their members held forth in the Odeon from time to time. One of them, the Aphrodisian Alexander, was among the second century's most respected commentators on Aristotle and actually lectured in Athens on the master's philosophy.

More rollicking diversions—boxing, acrobatics, tightrope walking—were offered in the Theatre, built in the second half of the first century B.C. but altered later to provide appropriate space for gladiatorial contests, and animal chases and baitings. Strong balustrades were added at this point to protect spectators in the lower tier of seats from the excesses of man or beast. The vast Stadium, like stadiums today, served primarily for athletic events and, much later, after an earthquake damaged the Theatre, for circus events.

As pervasive as the shouts of gladiators or the roars of beasts must have been the ring of metal on stone as the sculptors plied their trade. Just where these artists came from is not clear. Some may have been native, some may have come from Greece. Some, though it cannot be proved, probably moved from the notably art-minded Attalid kingdom of Pergamum in western Turkey after that regime ended around 133 B.C., rendering many highly skilled workmen unemployed.

Whoever they were, they maintained a profile much higher than many sculptors of antiquity. Thirty to 40 of their names have turned up on pieces of signed work around the Mediterranean; and in 1988 Erim's team found the name of Apelles Koblanos on the foot of a broken statue at the Portico of Tiberius in the Agora, the great market complex. A marble from Sorrento, in southern Italy, which is now displayed in the Naples museum, also is inscribed "Koblanos." Related? Nobody knows, yet.

Plentiful and beautiful as it was, the marble of Baba

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Dağ posed challenges because of its sheer weight. "The Romans, for all their genius, never invented the wheelbarrow," remarks Erim with a glint of amusement. "And one cubic meter [35 cubic feet] of Baba Dağ marble weighs three tons."

Their solution was to send workmen to the quarry early to do as much work as they could right at the site. They began on the western slopes in the morning, in the shade, and moved around to the eastern side in the afternoon. If the finished product was to be a sarcophagus, they hollowed out the inside right there and rough-cut the exterior design. If it was to be a statue or a bust, they cut to almost the dimensions required, and then moved the piece to the city workshops by oxcart. Excavators have found in abandoned and destroyed rooms near the Odeon and the Temple, remains of what may have been such workshops: three iron punches used to work the marble, heaps of chips tossed away as the carving progressed, and both discarded and unfinished pieces, perhaps rejected as inferior. In 1943 an Italian scholar, Maria F. Squarciapino, wrote that, based on known Aphrodisian sculptures, it was clear Aphrodisias had developed a true school of sculpture, not of mere copyists but of fine artists. Erim's excavations have confirmed her thesis.

Among Aphrodisias' glories are mosaics. This, from 4th century A.D., in basilica near Agora, is being cleaned.

Beginning in the fourth century A.D. after the fall of Rome in the West and the rise of Byzantium in the East, the workshops declined, as did the opulence of Aphrodisias itself. The Byzantine empire did not cherish the plastic arts, including sculpture, and its Christian rulers deplored the lingering pagan cult of Aphrodite. They turned her temple into a church, altering its simple classical style—eventually making the task of archaeologists more difficult—and tried to erase her memory by renaming the city Stavropolis, "City of the Cross." That name didn't really catch on, however, and after a wave of invaders and disastrous earthquakes and plagues in the fourth and seventh centuries, the site suffered a dramatic decline and may even have been virtually abandoned for a time. Later Byzantine sources refer to the remaining settlement as Caria. The Turkish village begun there probably in the 15th or 16th century was called Geyre, a corruption of Caria.

Aphrodisias was never really "lost," as were so many ancient sites. Its fame remained legend, and by the mid-18th century intrepid British and European explorers and travelers had located and described it. The first real excavator was Paul Gaudin, a Frenchman, in 1904 and 1905. Further work was done by Italy's Giulio Jacopi in 1937. Various difficulties and wars halted both efforts, however, and no concerted work was done until the arrival of Erim.

He is a man uniquely suited to the task. The son of a Turkish diplomat, he knows the land and its culture. Educated in Switzerland and the United States, he holds an M.A. and a PhD from Princeton, and is a professor of classics at New York University, under whose aegis his excavation at Aphrodisias has continued.

A true interdisciplinary collaboration

Erim puts in a long season each year, from late June to mid-October, because so many of his collaborators—art historians, architects, epigraphists, numismatists, geologists, restorers and sculptors—have other responsibilities and must fit Aphrodisias into a larger schedule. Yet the very essence of modern archaeology is the collaboration and cross-cultural, cross-disciplinary exchange of discovery, interpretation, publication. To this end Erim and one of his collaborators organized a colloquium at the University of Lille III in France in 1985, bringing together a dozen experts who had worked in different fields at Aphrodisias. Their meticulous reports were published in the language of their authors—English, French, German, Italian. There was

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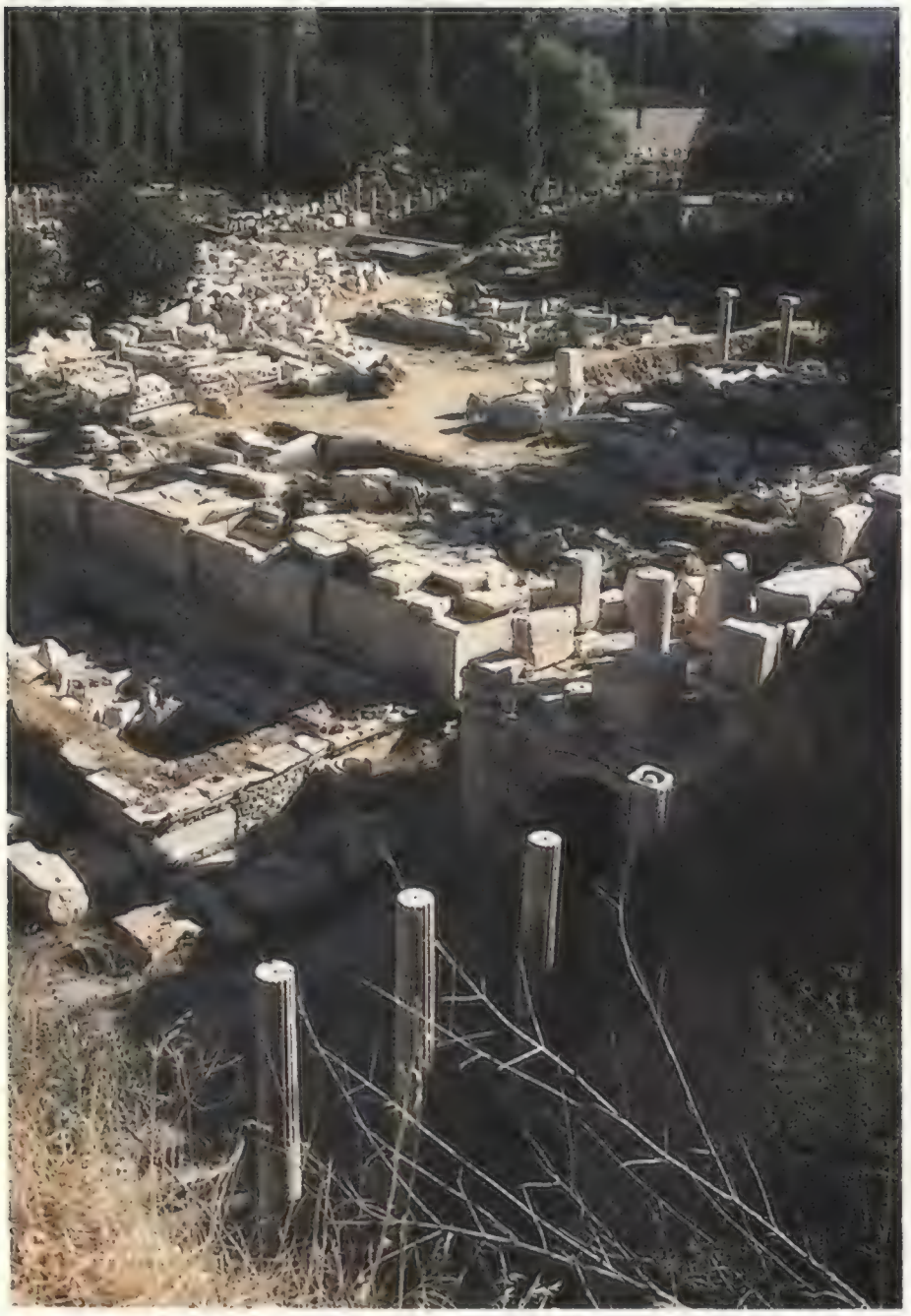
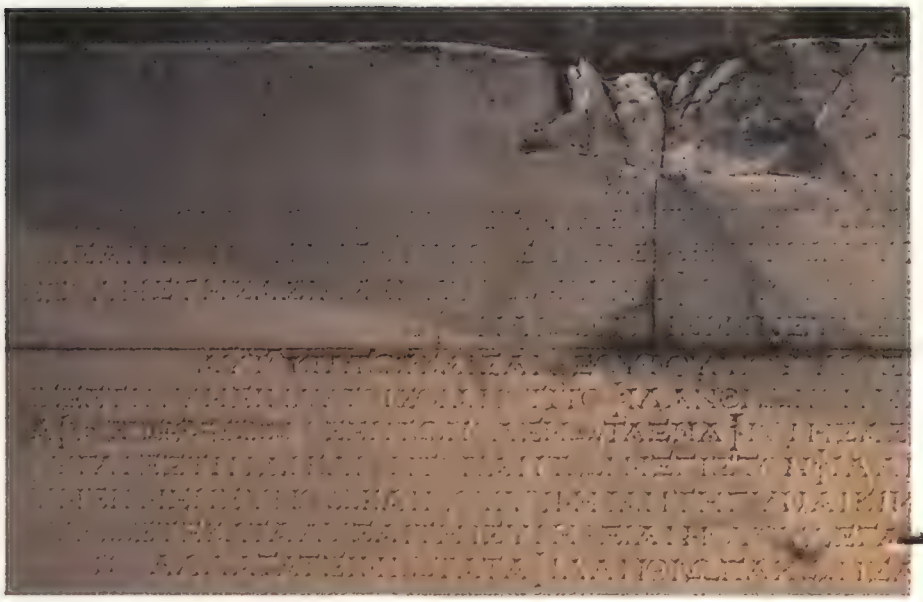


At center, foundation remains of monumental Agora Gate; in front, south columns of Portico of Tiberius.



Partial letters from Octavian, in Greek: top claims Aphrodisias for his own; bottom addresses the Samians.

An Aphrodisian sculptor's skill is shown in this relief of Aphrodite drying her hair before admiring Tritons.

a similar meeting in London in 1987, and Erim hopes for one in New York City in the spring of this year.

A benign emperor of the city he has made his own, Erim has taken over one of Geyre's more solid remaining houses as residence and headquarters, expanding it to include housing for his collaborators, a screened dining area, a small library, primitive but bearable plumbing, and a tightly fenced and locked garden. He determines which scholars will come, what they will do, when and what they will eat. At the sound of the meal bell there is a tremendous scurry because he does not like waiting, and when he commences a long story—he is a fine raconteur—everybody listens. He is also something of a romantic and mealtimes are gay with classical music resounding from his hi-fi. The dining table is ablaze with fresh flowers and, usually, a recent lovely marble find as centerpiece. He gives full credit to colleagues, encourages their publishing efforts and gains great loyalty. The team's chief epigraphist, for example, Joyce M. Reynolds of Newnham College, Cambridge, has worked at the site since 1966; and Nathalie de Chaisemartin, art historian currently at the University of Bordeaux, since 1977.

"Paper is of the utmost importance to us," says Erim. "Not only the papers in publication form, but also for restoration. All of our restoration truly begins on paper. We dig, of course, but then we photograph the finds, we draw them, study where one piece might relate to another. Architects project on paper how they feel the structure might have looked before it tumbled. Art historians can draw relationships on paper and then, if they seem logical, try to unite marble pieces once again."

It is in fact like a jigsaw puzzle, one whose pieces can weigh a ton or more. It takes six or eight of Erim's sturdy Turkish workmen, mostly farmers from nearby, to move a five- or six-foot panel onto a cart and then shift it to safety inside the archaeologist's compound,

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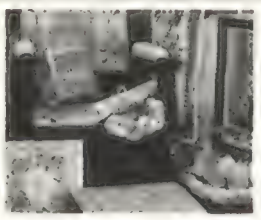

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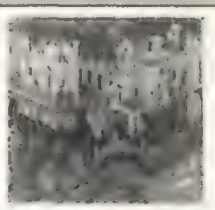

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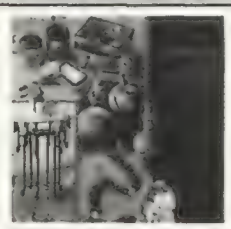

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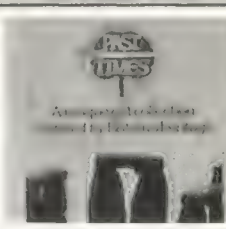

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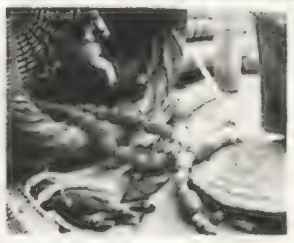

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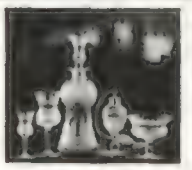

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or to attempt to lift a slice of a fluted column back up onto its base.

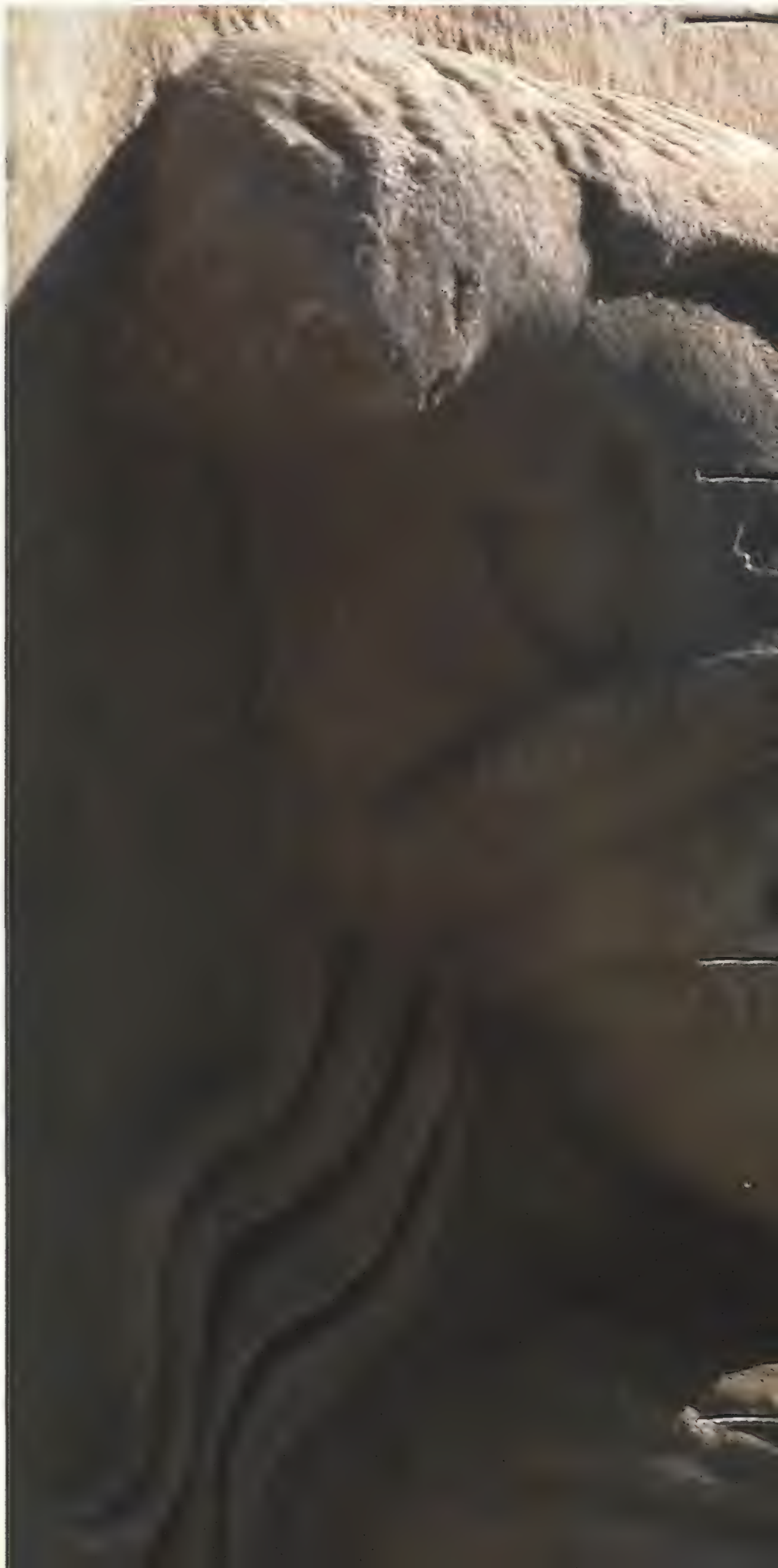
Now and again they get it wrong, Erim admits with a short laugh. "We excavated around the great Tetrapylon [a monumental decorative gateway near the Temple of Aphrodite complex] and modestly restored it in 1963," he says. "Then in 1970 one of our collaborators, Alois Machatschek of the Technical University of Vienna, studied all of the architectural elements and made beautiful drawings of how the restoration probably should be. This provided the impetus for a full restoration. So we took it down again, and studied and excavated the area thoroughly. A specialist in the restoration of ancient architecture, Friedmund Hueber, and architect Gerhard Paul helped us develop a plan for its reerection. Last season we managed to hire a crane for a month and began to put the columns back up. I think we have it right this time." Thirteen of the 16 columns were reerected in 1988 and two Corinthian capitals recast. The east and west facades' entablatures and pedimental decorations, as well as the eastern door frame, were reassembled on the ground. Top priority of the coming season will be to place them in position and complete the restoration of the Tetrapylon.

Perhaps even more important than the Tetrapylon, and certainly more rewarding in terms of the treasure of its carved marble panels, is the grand Sebasteion, a sacred area dedicated to the emperor Augustus and his Julio-Claudian descendants. (The name comes from "Sebastos," Greek for "Augustus.") Hidden under a road and some Geyre peasant houses until 1979, it has now been excavated to reveal two parallel porticoes about 263 feet long and 46 feet apart. Once they stood three stories high, with facing facades and decorative relief panels set between the half columns on the second and third stories. These panels are among the best preserved and artistically most beautiful of all Aphrodisias' treasure.

A provocative and totally unforeseen discovery of the past season was an enormous pool about 3 feet deep, stretching 460 feet along the length of the Portico of Tiberius. Toppled sculpture indicates it once was ringed with decorations, and around its periphery were theaterlike seats. Whether it was a huge reflecting pool or a utilitarian pool remains a mystery, Erim says, pending further investigation this year.

What is still to be done? Erim is keenly aware that after 28 years of dedicated, superbly productive work, he has uncovered only the heart of the city and that much more lies around it. Tourists come in thousands to stroll through the partially reconstructed remains and visit the museum (about 200,000 in 1988, primarily German, French, Italian and Turkish), but they cannot see the beautiful pieces in the walled garden and there isn't yet a truly useful visitor's map of the site.

"Our ultimate goal, of course, is to put most of these pieces back onto and into the site," he says. "Many of the buildings can be reconstructed, roofed, protected, to make an open-air museum, an archaeological park.



Sebasteion's superb reliefs include the Amazon queen Penthesilea (left) and heroic Greek warrior Achilles.

We could reerect part of the south portico of the Sebasteion to its original three stories and put back some of the panels that were once there. And of course, the Tetrapylon. We once thought of putting the museum in the Theatre Baths, and I believe we can still use them for some of the statues and friezes. It would be appropriate, for in Roman times the baths were full of mosaics, statues, works of art. There is a compactness, a concentration, of site here that would make it easy to stroll through, and to protect."

Like all serious archaeologists, he yearns to take down the fences, make all the wonders visible and give "his" city back to the world. "Aphrodisias," he wrote at the end of his 1986 book about his work there, "is unique not only as a treasure house of archaeological finds, but also as a place where those willing to establish a dialogue with the past may commune . . . with the beauty and harmony of the ancient world."

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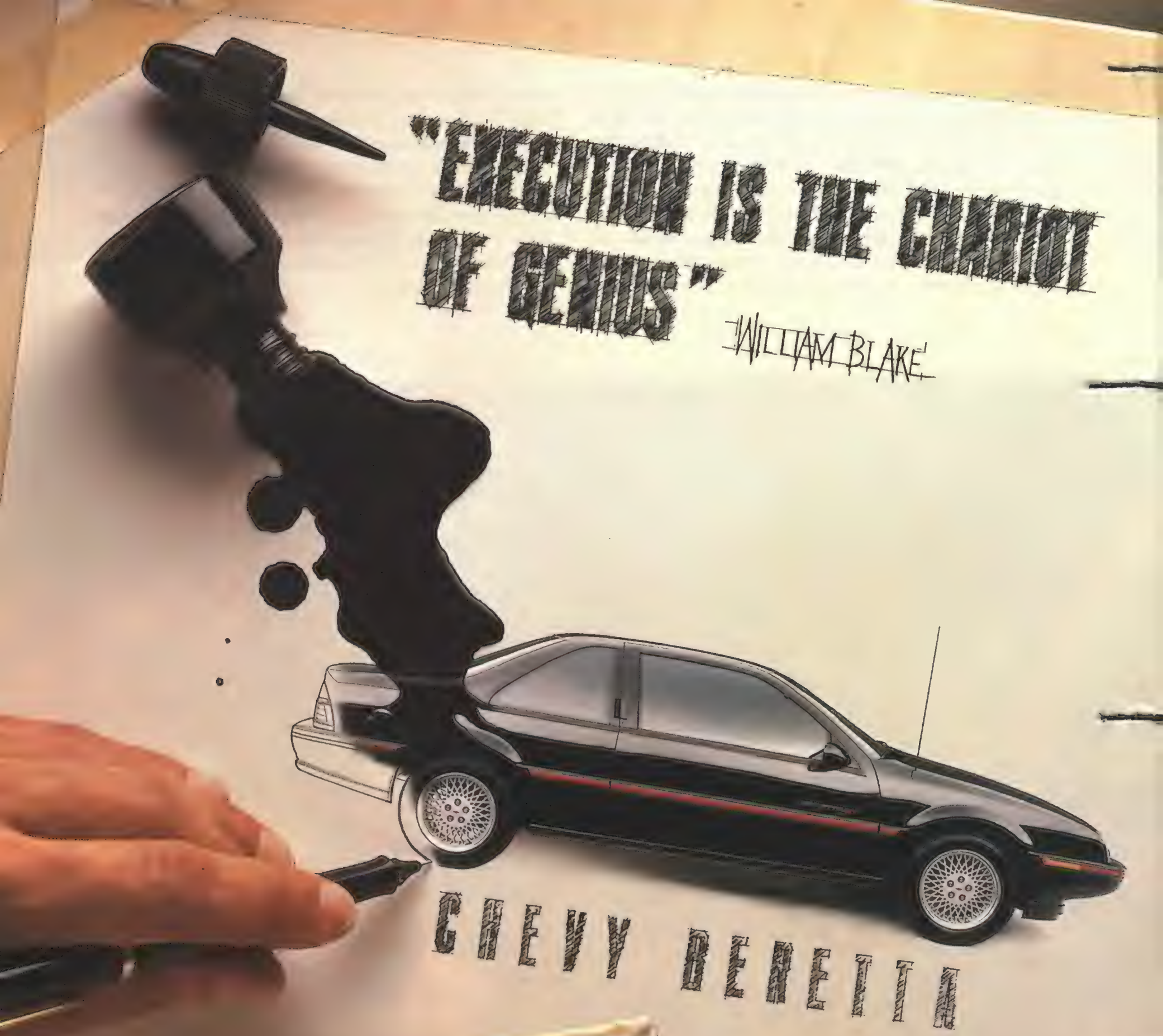

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By David M. Schwartz

On the royal road to adventures with 'Daring Dick'

Halliburton is the name, travel writing's his game, and stunts are his ticket to romance and fame

Dashing journalist Richard Halliburton strikes characteristically jaunty pose atop the Mexican volcano Popocatepetl in 1928.

Late in the summer of 1928, a self-assured American traveler surprised Gen. M. L. Walker, Governor of the Panama Canal Zone, with an extraordinary request. He wanted permission to swim the entire length of the 50-mile canal, from the Atlantic to the Pacific, including passage through all six locks. The governor raised many objections—alligators, sharks, barracuda and typhoid—but the young man was prepared for them. He planned to swim beside a rowboat manned by a sharpshooter, and he had inoculated himself with anti-typhoid vaccinations. Finally General Walker presented what must have seemed to him the ultimate obstacle. "Think of the terrific expense to the government," he protested. "How would you meet the lock charges?"

"Just as the other ships meet it, sir," the traveler replied. "According to my tonnage."

Remarkably, Walker agreed, and 28-year-old Richard Halliburton was off and swimming. The toll for the S.S. *Richard Halliburton*, as he jokingly called himself, turned out to be 36 cents. It was the smallest in the history of the canal.

Since his graduation from Princeton seven years earlier, Richard Halliburton had divided his time between undertaking madcap pursuits in the farthest corners of the globe and recounting his adventures in an enthralling way that kept all America agog. He tramped once around the world and then went back for more. He circumnavigated the Mediterranean in the wake of Ulysses. Emulating Pheidippides' celebrated run, he set off on foot from Marathon to Athens; tracing the ghost of Cortés, he crossed the highlands of central Mexico. Like the mythical Leander, he swam the Dardanelles between Europe and Asia, triggering a minor craze as college boys, too, began taking the plunge.

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Sharpshooter and oarsman watch for gators and sharks while author treads water during 50-mile swim through Panama Canal.

By the time he unlimbered his antiquated sidestroke in the Panama Canal, Halliburton had two books on the best-seller list. Bubbling over with enthusiasm, richly reflective and liberally sprinkled with history, mythology and classical poetry, his travelogues were, next to school texts, the books most widely read by a generation of American students. On the lecture circuit, his dash and eloquence proved irresistible to the ladies and impressive to even the most worldly-wise of husbands. He was Marco Polo and Indiana Jones wrapped up in one, with P. T. Barnum's flippancy and James Bond's bravado, capped off by F. Scott Fitzgerald's aristocratic good looks and manners.

The canal swim typified what really made Halliburton Halliburton: there seemed to be no reason to do it in the first place, except for the challenge and the romance. It took him eight days but in the end he pulled it off, just as he had pulled off many previous stunts and as he would countless others in the future. Eventually he would meet a challenge that demanded more pluck, or luck, than even Richard Halliburton could muster, but until then "Daring Dick," as the headline writers dubbed him, continued to bask in the glory of public adoration while smarting at the sting of decidedly mixed reviews.

If Halliburton broke like a tidal wave upon the '20s, the '20s were more than ready for the deluge. The post-World War I era of high living and nonstop zaniness had arrived. Across the oceans, an exotic world beckoned, and those Americans who were wealthy enough to travel responded to its call. As for the rest, they settled for heroes who could do their traveling for them.

Even before the war, Burton Holmes, granddaddy of the "travelogue" (a term he coined), had been wowing audiences with stereopticon shows of faraway places. Soon he was joined by a legion of other adventurers including Lowell Thomas, who brought home stirring accounts of T. E. Lawrence's Arabian campaign,

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and Osa and Martin Johnson, the filmmakers who projected remotest Africa and the wilds of Borneo onto the nation's theater screens (SMITHSONIAN, November 1986). Few globe-trotting journalists could match the output of travel writer Harry Franck, who wrote more than 20 books with such evocative titles as *A Vagabond Journey Around the World, Four Months Afoot in Spain* and *East of Siam.* Halliburton heard Franck speak in a town near Princeton one evening and arranged to meet him for dinner. Already an admirer of the writer, the impressionable youngster was so taken with Franck in person that he began to think seriously about pursuing a similar career. "The world doesn't really want philosophers and intellects," he concluded. "The world wants escape—it wants romance."

As a child, Richard Halliburton had shown no particular interest in excitement. Born near Memphis in 1900, he was a somewhat delicate boy who preferred solitude to sports. At Princeton, he immersed himself in history and literature, particularly the poetry of Lord Byron and Rupert Brooke. He was also smitten by one passage of Oscar Wilde's: "Don't squander the gold of your days, listening to the tedious, or giving your life away to the ignorant and the common .... Live! Live the wonderful life that is in you." Those words, he said, "burned themselves into my memory."

In July 1921, accompanied by one of his college roommates, Halliburton sailed for Hamburg. "My trip is my occupation in life," he told his parents. "I've gone to work." What he had in mind was the beginning of a great intercontinental vagabondage. Along the way he would produce travel articles for newspapers and magazines, and when he returned he would put his assorted writings into something much bigger.

David Schwartz's past contributions include articles on soda fountains, Sears prefab houses, weather vanes.

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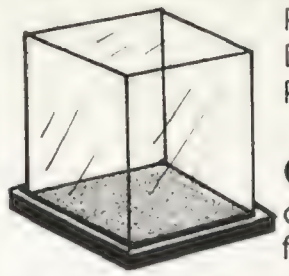
The two Americans arrived in Zermatt, Switzerland, in late September and managed to find guides willing to take them up the Matterhorn that late in the season. On the way, with a 3,000-foot drop on either side, Halliburton slipped twice and hung from his safety rope "like a sack of cement." Fingers numb, faces raw, clothing torn, he and his companion reached the summit so spent and scared they could hardly speak. But when he wrote about the experience, he called it the "fiercest moment of intense living I ever experienced."

Parting company with his friend in Paris, Halliburton headed south. In Gibraltar, he ignored rules prohibiting cameras and shot five rolls of film before landing in jail. At his trial four days later, he was sentenced to either 30 days or a fine that amounted to more money than he had. He borrowed the sum from a young Chicago architect he was traveling with at the time and took the first train to Marseilles. The experience may have reinforced the lesson he learned on his Matterhorn climb: no matter how blundering his course or reckless his behavior, he could squeak by. Even better, his gaffes made good copy. When Halliburton published an ac-

Halliburton spoofs a statue in Germany soon after graduating from Princeton.

DISPLAY CASES



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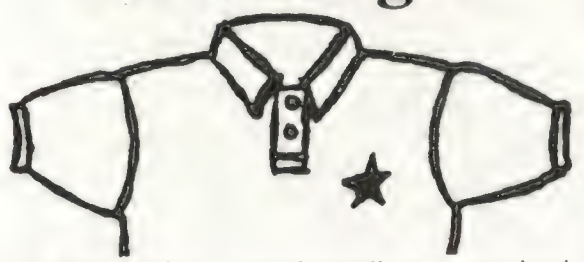

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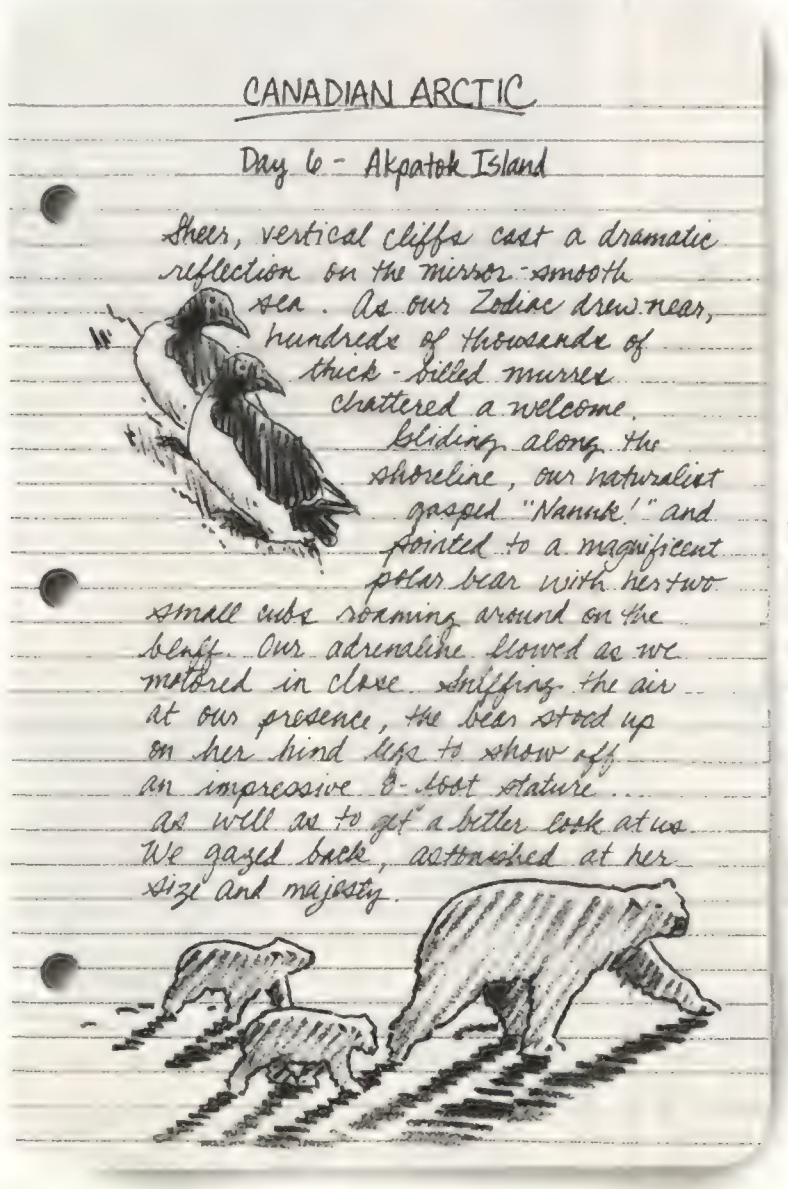
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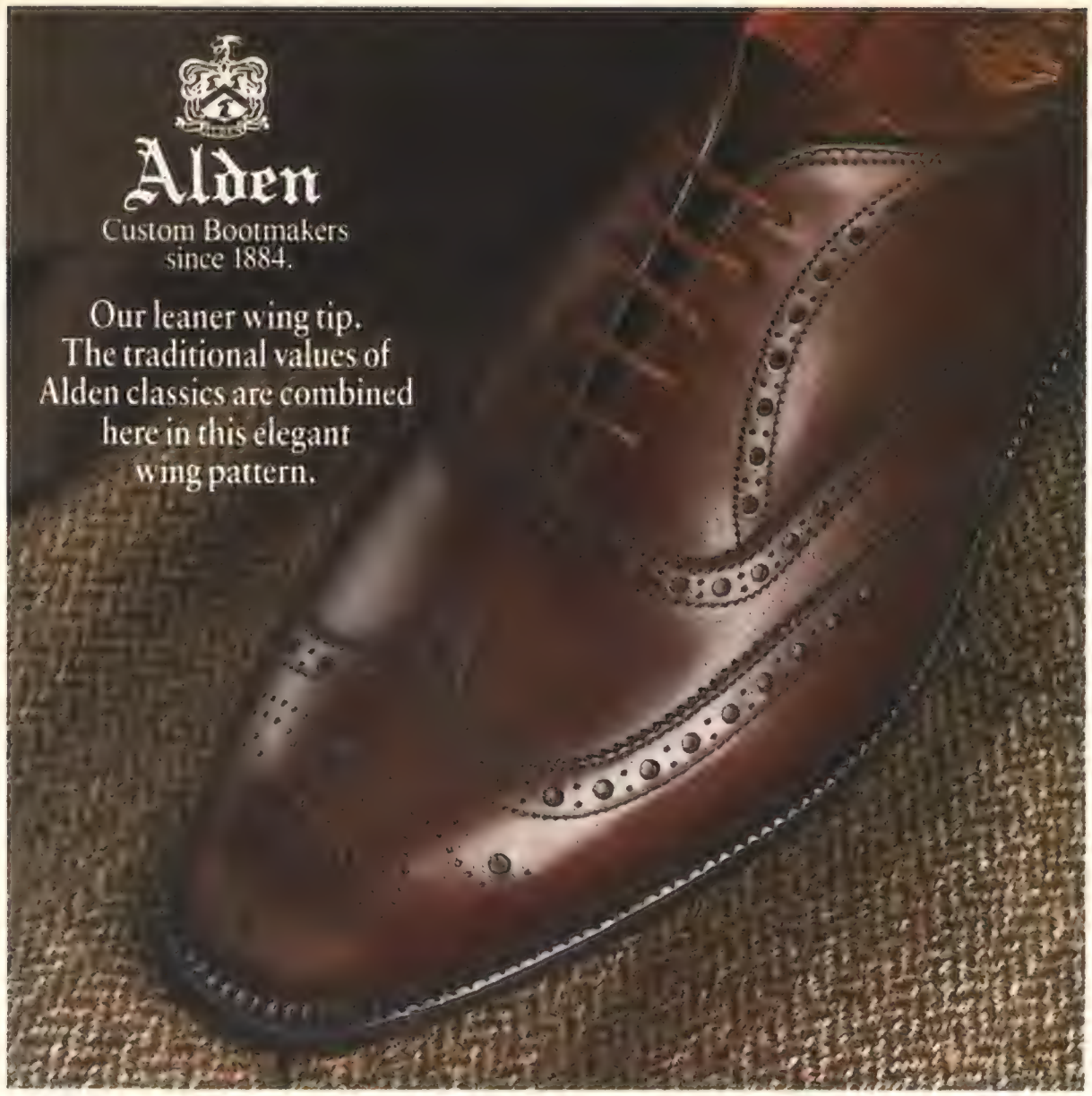

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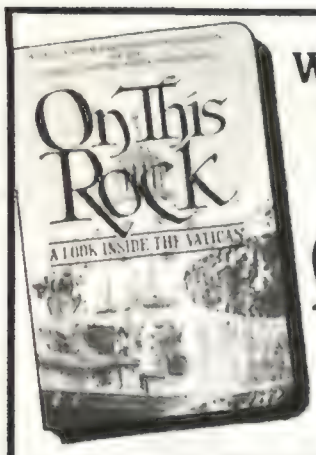
Writer affects a turban on 1922 visit to Taj Mahal, featured in his first book.



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count of his Gibraltar escapade, it was full of cloak-and-dagger suspense and a good last laugh—12 forbidden photographs of the fortress, printed from the film he had managed to smuggle out.

In Egypt the brash young traveler spent a night atop a pyramid and swam across the Nile, failing to realize that the current would sweep him far downstream of the spot where he had hidden his clothes. Unable to speak a word of Arabic, he nevertheless managed to communicate his plight to a boatman who lent him a pink cotton nightgown and hid him aboard his vessel until nightfall, when he returned to his cache.

Halliburton's penchant for slipping out of clothes and into water surfaced again in India when he hid on the grounds of the Taj Mahal at closing time in order to have the building all to himself. Under a gibbous moon, he silently lowered himself into the deepest reflecting pool and lay there until dawn, intoxicated with the set-

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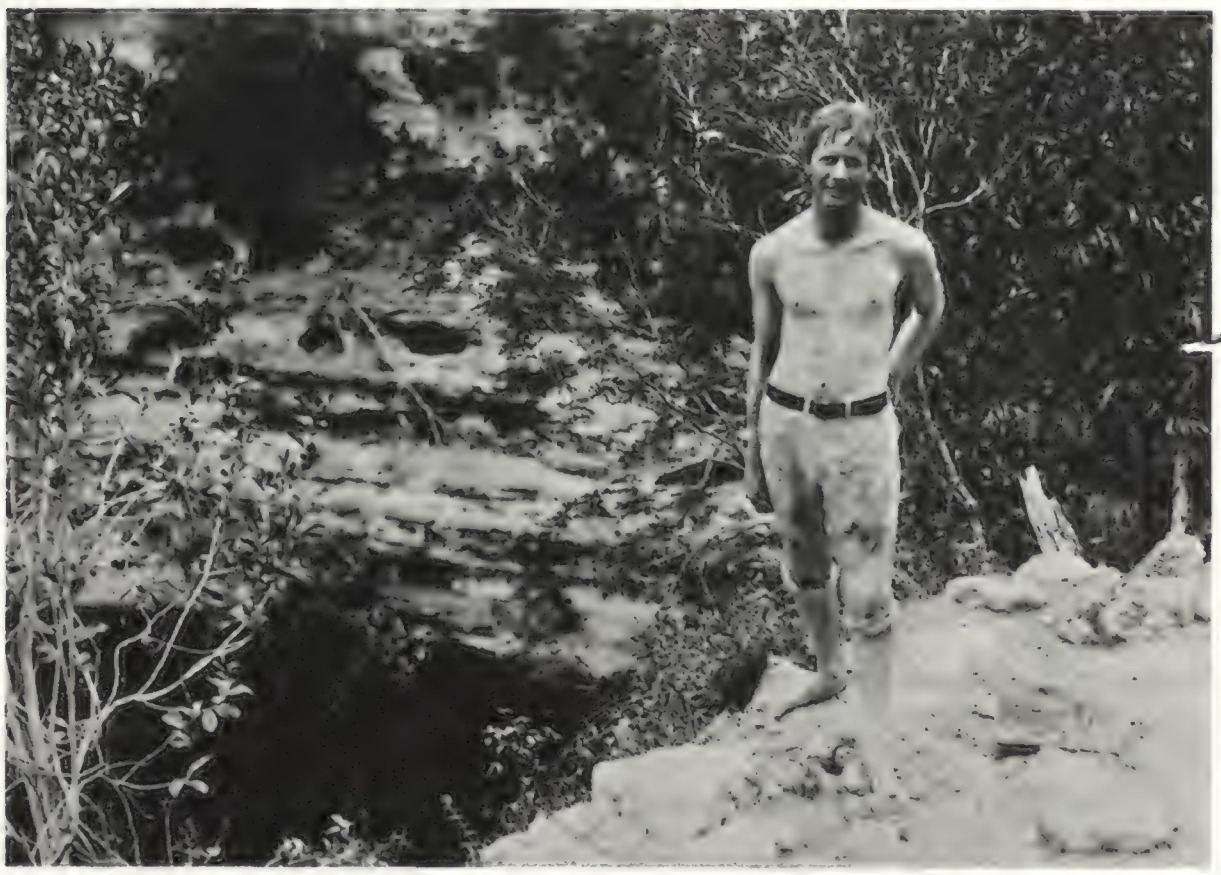
ting. "Alone, in all this supernatural beauty, resting by the pool before the phantom Taj," he wrote, "I felt myself transported to some previous existence that knew neither time nor space nor substance."

Back in his temporal existence, the wayfarer slogged across the Malay Peninsula, lived as a beachcomber on Bali and stowed away on a ship bound for Singapore. He sailed out of Macao on another ship that was sacked by pirates who stole his money, shoes and coat. His feet swaddled in burlap, he turned up in Manchuria, where the temperature was 20 below. In Japan, after being told it had never been done—and couldn't be done—he made a midwinter, solo ascent of Mount Fuji. He sold a story of the climb, along with pictures of the ice-whipped crater, to a Tokyo newspaper. Then he sailed home. The 50,000-mile trip had lasted 600 days, and his writings—including an article on Tibet which was accepted by *National Geographic*—had earned him $300 more than it cost. He headed for New York, determined to find a publisher for a proposed book.

It turned out to be a long search. One after another, the publishers spurned his writing as hopelessly sophomoric. In desperation, he decided to try lecturing. His first talks, before girls' schools and women's clubs, paid $15 to $25 apiece. A short time later, he was on the rostrum of New York's Princeton Club when the editor in chief of the Bobbs-Merrill Company walked in late and quietly took a seat. "He looked like an Apollo," D. Laurance Chambers later wrote. "His light hair made an aureole round his face. His eyes flashed. He was on fire with enthusiasm. Impetuous words, full of life and color, poured from his lips. The effect was electric." A few weeks later, Halliburton was arguing with Bobbs-Merrill about his forthcoming book's title. "If you don't want to publish it under my title," he declared, "then it won't be published." Chambers backed down. It would, as Halliburton insisted, be called *The Royal Road to Romance.*

With the book still in production, Halliburton was off again, this time to retrace the wanderings of Ulysses, whom he regarded as a kindred spirit.



Halliburton shows no ill effects after jumping into watery pit where the Maya allegedly sacrificed virgins to rain gods.

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He also had a few side trips in mind. One of them involved the realization of a longstanding goal: to swim the Dardanelles, the strait that separates Asia from Europe. Romantic that he was, Halliburton insisted on calling the strait by its ancient name, the Hellespont. "What legend in all history is more romantic than the legend of Leander's tragic, clandestine amour with Hero for whom he nightly swam the Hellespont?" he later wrote. His own idol, Lord Byron, had lived at the water's edge and himself duplicated the swim in 1818.

Halliburton occupied Byron's home and prepared to make the five-mile crossing. He also set up a publicity stunt that nearly backfired. A friend in Athens agreed to send a communiqué to the *New York Times* reporting that the young American had drowned. Meanwhile, Halliburton wrote his father and his publisher, warning them about the ruse. The *Times* story ran before his letter reached the States. Both Chambers and his father insisted that the report was preposterous, but even so, three weeks passed before Halliburton, like Mark Twain, was able to convince everyone that reports of his death had been greatly exaggerated. "I only wanted to remain dead for a week or ten days," he confessed.

He was home by Christmas 1925 and found mixed reviews for *The Royal Road to Romance.* If some of the more vitriolic critiques stung, he was able to console himself with the sales figures. By late January the book was on the best-seller list, and by the end of 1926 it had sold 100,000 copies, earning him $70,000 in royalties. He was feeling so cocky that when Cecil B. De Mille inquired about motion-picture rights, he said he'd consider it for $50,000 and a major part. He never heard from De Mille again.

It didn't matter. Halliburton was on a roll. He wrote *The Glorious Adventure* about his Mediterranean peregrinations and it, too, quickly became a best-seller. He again took to the lecture circuit, barnstorming schools, clubs and auditoriums for a guaranteed $750 per week, causing at least one near-riot among people who couldn't get seats. He would eventually command the highest lecture fees in America during those years—more than $500 a shot. The man who had spurned what he called the "commonplace quest for riches and respectability" was, through his uncommon quest, on his way to becoming rich.

On ocean liner in 1931, famous author dresses the part, from top hat to spats.

But he still wasn't getting much respect. He was mocked as "Richard the Literary Lionhearted." His third book, *New Worlds to Conquer,* was dubbed "New Ladies' Clubs to Conquer." His deeds were the butt of satirical essays and cartoons. The higher his sales soared, it seemed, the lower his literary esteem sank.

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crowned rock-altar, spread beneath its halo of immortality, gleamed the most radiant, the most delicate, the most sacred shrine we were to find in all our pilgrimage—*ATHENS!*"

It wasn't just Halliburton's purple prose the critics scorned. There was also the matter of his veracity. Time after time, doubters called him a sham, his books fiction. Their evidence usually boiled down to one purported error. Since the Taj Mahal's reflecting pools are but three inches deep, they claimed, Halliburton could not possibly have "bathed" in one. In fact, one of the pools is four feet deep. Halliburton may have been the consummate embroiderer, but the fabric of his tales was usually whole. "When I say I did something," he once told his father, "I actually did it. But I splash a little red paint on it to make it more interesting."

His red paint consisted mainly of harmless fibs. He thought smoking was a debonair trait, so his publicity photographs sometimes featured him with a cigarette; actually, he abhorred tobacco. In *New Worlds to Conquer,* the attentions of a lovely senorita punctuate the canal swim; in adult life, at least, he evinced no romantic interest in women. But the Taj controversy taught him to document with a camera the important feats that were the backbone of his books. After jumping 70 feet into the water of the "Well of Death" in the Yucatán—where the Maya supposedly sacrificed virgins to the rain gods—he returned the next day to do it again for newsreel photographers.

Richard Halliburton was as quirky as his career. He viewed himself as a celebrity and wanted to make sure everyone else did, too. On lecture tours, he turned up in backwater towns outfitted with spats, a derby hat and a black, silver-tipped cane. At formal dinner parties, on the other hand, he was known to appear in tennis shoes and a sweater. Later in life, he dressed almost entirely in white; for special effect, he might tuck a lace handkerchief up his coat sleeve.

Not surprisingly, the man who fol-

With pilot Moye Stephens at controls in rear seat, Halliburton prepares for takeoff in his scarlet biplane called *The Flying Carpet.*

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lowed his wildest dreams to the ends of the Earth was accused of being an "outgrown adolescent." Lighthearted and full of fun, he was loved by family and friends for his warm, generous, sociable qualities. He wrote long letters to dozens of correspondents and gave out money as freely as most people give out advice. He was the sort who would mug at cameras or put salt on a friend's cereal for a joke. He adored children and spent hours playing with them, reading to them, regaling them with tales and eventually writing two travel books for them, *The First Book of Marvels* and a sequel. It sometimes seemed as if he were a child himself.

At 140 pounds, Halliburton was no muscleman; some acquaintances speculated that his extraordinary physical endeavors were fueled by an obsession with proving his masculinity. Although it was a fairly well kept secret during his lifetime, he was evidently homosexual. He took pains to conceal this in his books, but he had numerous gay contacts around the world and at home in California.

Perhaps the pressures of maintaining a dual identity contributed to Halliburton's erratic mood swings. In private life he was often temperamental and he occasionally snapped at reporters, but his devil-may-care image was his stock in trade, and he seldom let it slip. "As long as my books sell 100,000 copies a year," he said, "the cartoonists can have their fun."

Still, he longed for critical approval and began working on a book he hoped would boost his literary reputation. It was to be a biography of another of his heroes, the romantic English poet Rupert Brooke, who died in 1915 at the age of 28. As it turned out, however, Halliburton the biographer had to take a backseat to Halliburton the travel writer.

New Worlds to Conquer appeared two weeks after the 1929 stock market crash. It made the best-seller list but in those dark days that didn't mean much—people just weren't buying books. Halliburton had begun to discover, Oscar Wilde notwithstanding, that living the "wonderful life that is in you" was not cheap or easy. His financial worries were mounting, in part due to huge losses in the crash. His success as an author depended on his ability to think up new ways to

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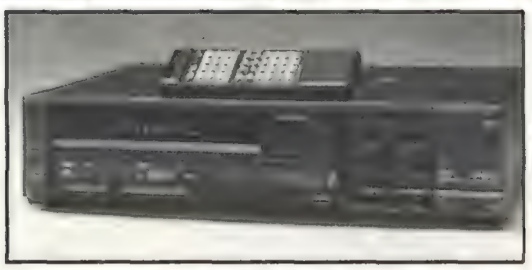

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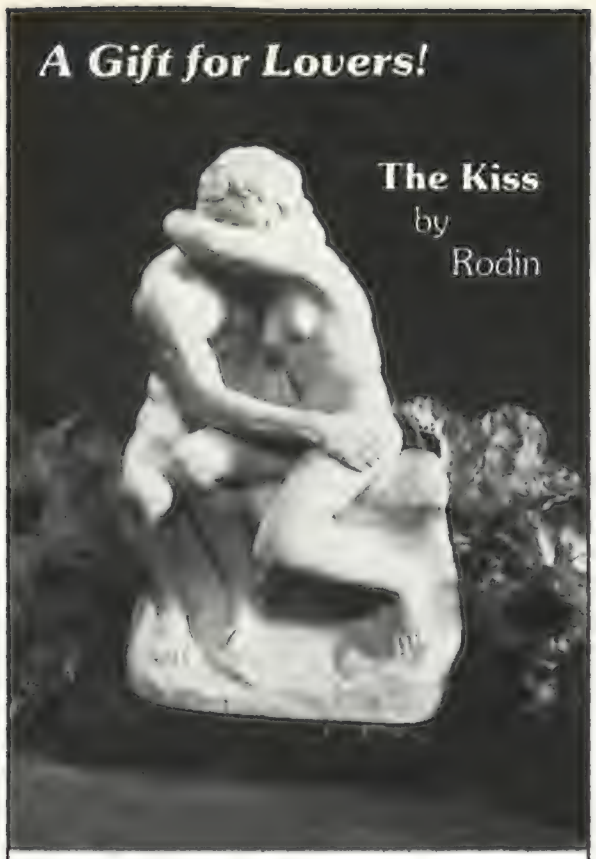

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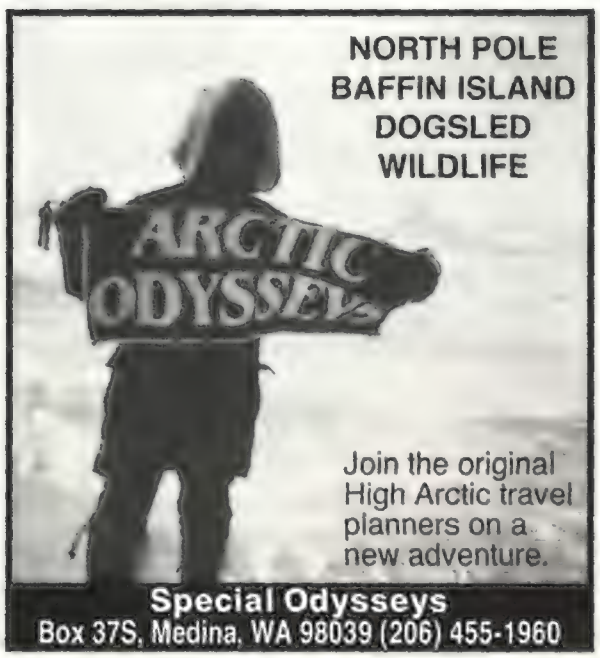

command public attention. The only solution he knew was ever more sensational stunts.

"An adventure not in the air is obsolete," he declared in 1930 when he bought an open-cockpit Stearman biplane, painted it scarlet and named it *The Flying Carpet.* With pilot Moye Stephens, he took off from Paris and zigzagged across three continents on a journey that lasted nearly two years. In Algeria, he marched with the French Foreign Legion and almost passed out in the searing heat of the Sahara. He flew up the slopes of Mount Everest to an elevation of 18,000 feet, nearly ending the journey when he stood to take a picture and the drag of his body stalled the plane. He swam across the Sea of Galilee (his back blistering from sunburn) and hobnobbed with headhunters in Borneo (inventing a story about how they gave him several trophies). It was all vintage Halliburton, but now there was a difference: it wasn't much fun anymore, and he was afraid this would show through in his writing.

It didn't. *The Flying Carpet,* a book about his airborne adventures, received more critical praise than any of his earlier efforts. Halliburton was mobbed wherever he went, but the economy was still locked in the De-

Halliburton, who adored children, talks to Dyak girl after landing in Borneo.

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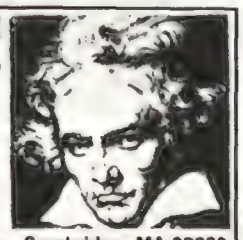

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pression and sales of the book were abysmal. The plane trip had cost him $50,000 and he was flat broke. So he became desperate enough to accept moneymaking schemes that ranged from endorsing coffee in magazine ads to starring in a third-rate feature film called *India Speaks.*

Reluctantly, Halliburton agreed to contract with the Bell Newspaper Syndicate for 50 weekly articles. He went to Cuba to charge up San Juan Hill like Teddy Roosevelt, then crossed the Atlantic to revisit some of his old haunts. He followed in Hannibal's footsteps across the Alps with a docile pachyderm from the Paris zoo—she was named Elysabethe Dalrymple. "Dally," who played the harmonica with her trunk, entertained throngs of spectators on her way up the Great St. Bernard Pass into Italy. On the way down, however, her feet developed such bad blisters that Halliburton decided to ship her back to Paris in a boxcar. He visited her three days later bearing two pounds of sugar and a new harmonica.

As with *The Flying Carpet,* sales of his next book, *Seven League Boots,* a collection of his newspaper pieces, were weak. To make matters worse, attendance at his lectures was thinning. It was 1937 and the country was preoccupied with the looming war, but Halliburton needed cash as badly as ever. He was building a spectacular ridgetop house in South Laguna Beach, California, 60 miles below Los Angeles, and he was entertaining extravagantly in a social circle that included silent-film star Ramon Novarro, bodybuilder Leopold De Sola, aviatrix Pancho Barnes and photographer George Hurrell. Despite hard times, there was no letup in Halliburton's generosity: he built his parents a house in Memphis and sent them on a European tour.

After enduring a decade and a half of constant travel and the relentless pressures of producing one book after another, Halliburton no longer had many illusions about the carefree life

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of a merry wanderer. Increasingly he coveted security and longed for a more serene existence, but he seemed to be caught in a trap. His very adventurousness and his early success at making it pay had set that trap. Now he knew no other way to earn a living. Like the millions of Americans whose humdrum lives he had sought to avoid, Richard Halliburton—international hero, world-class romantic, legend in his own time—was working only for a paycheck.

In the spring of 1938, he announced that he would undertake one last adventure. It would be an exploration of his own country, and it would result in a farewell book called *The Royal Road to Romance in the U.S.A.* But Halliburton being Halliburton, he would give it a headline-grabbing kickoff by building a Chinese junk in Hong Kong and, with a captain and a full crew, sailing 9,000 miles to San Francisco in time for the Golden Gate International Exposition in the spring of 1939.

He named the vessel *Sea Dragon* and adorned the hull with ferocious red-and-yellow dragons. With its dazzling paint job, vermilion sails and three poop decks, it was the talk of the Kowloon docks. In more prosperous times Halliburton might have reveled in the attention, but now he found himself in a deep funk. To finance the project, he had mortgaged his house and taken on backers. He planned to make the junk pay by charging fairgoers $1 a head for a cruise around San Francisco Bay. But cost overruns were rampant, and long delays meant he might not get there in time. To make matters worse, the Formosa Strait was patrolled by pirates and Japanese warships, and the junk turned out to be frighteningly unstable. It rolled perilously and sat so low in the water that the portholes had to be boarded up.

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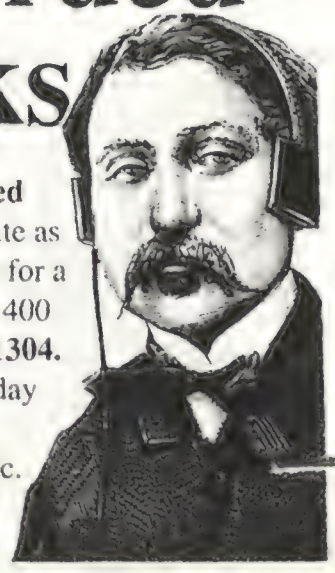

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later, the seas were calm and all had gone well halfway to Midway. Then the weather turned. On March 24, the liner *President Coolidge*, 1,800 miles west of Hawaii, received a message from the *Sea Dragon*: SOUTHERLY GALES . . . RAIN SQUALLS . . . LEE RAIL UNDER WATER . . . WET BUNKS . . . HARDTACK . . . BULLY BEEF . . . HAVING WONDERFUL TIME . . . WISH YOU WERE HERE INSTEAD OF ME. Gale-force winds and 40-foot seas were battering the *Coolidge*, and the captain ordered a double lookout to watch for the *Sea Dragon*. A bottle of champagne was offered for a sighting. It was never claimed.

Richard Halliburton may have been hoisted with his own petard. Before sailing, he had told friends he might "play dead" again to inflate a few headlines. Suspicious of another ruse, the Navy waited six weeks before launching a search. When they finally did comb 108,000 square miles, they found nothing.

Some of Halliburton's admirers took solace in the fact that his death at age 39, in full sail and midadventure, was a fitting finale to a swashbuckling life. Surely it was the sort of thing he'd

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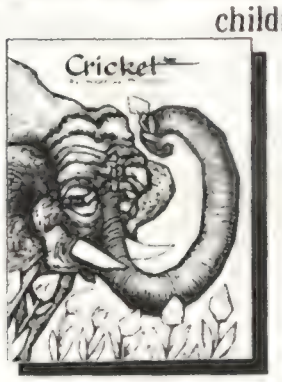

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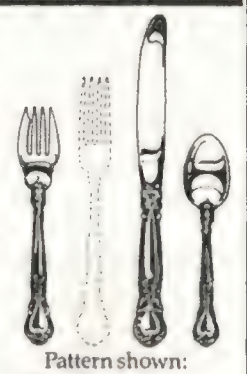

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had in mind 20 years earlier when he summarized his emerging philosophy in a letter to his parents: "And when my time comes to die, I'll be able to die happy, for I will have done and seen and heard and experienced all the joy, pain, thrills—every emotion that any human ever had—and I'll be especially happy if I am spared a stupid, common death in bed."

But many among his devoted legions refused to believe that the invincible Richard Halliburton had gone down at all. He was hanging out somewhere, they said, waiting for the right moment to reappear. One rumor had him living on a desert island with Amelia Earhart, whose plane had disappeared in the South Pacific two years earlier. In mid-June of 1939 a picture caption in *Time* read, "The late (?) Richard Halliburton." And even as recently as 1976 an elderly woman was quoted in the *Los Angeles Times* saying, "Do you think he'll ever come back? He was so beautiful."

Halliburton's unstable junk rolls in the wind near Hong Kong before starting on its doomed journey half a century ago.

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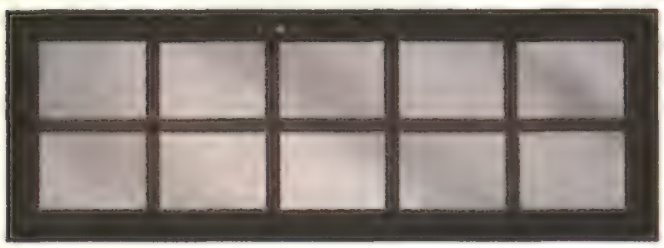

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Book reviews

Dreamings: The Art of Aboriginal Australia
Edited by Peter Sutton
Asia Society Galleries/George Braziller, $65; paperback, $45

Earlier in this century, artists and collectors generally ignored the context of the sacred in their acquisition of ritualistic works of art. Picasso once remarked that the only things he needed to know about Africa could be found in the ebony carvings he so admired. In essence, many traditional objects were stripped of their holy purpose and, despite the best intentions of curators, valued for strictly esthetic reasons. One aim of

Aboriginal acrylic tells of origins of water holes and streams near Japingka.

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Dreamings is to prevent this from happening to Australia's traditional art.

Sutton's book—in fact a catalog accompanying an exhibition of 103 works touring the United States through the spring—is what every scholarly study longs to be: beautifully designed, superbly researched and electrifying to read. With the utmost respect for aboriginal tradition, its contributors outline the often alien worldview of a people left utterly alone for some 30,000 years.

Most aboriginal art depicts what are called "Dreamings." At their simplest, the Dreamings simultaneously represent ancestral beings, places associated with these totemic creatures, and the mythological events that invest such landmarks with a sacred character. By focusing on the Dreamings, these works of art instantly achieve multiple levels of richness. They are, first of all, beautiful to look at—typically crosshatched or pointillist abstractions, though some clans favor the pictorial and might even indulge a solemn eroticism. Sometimes the same works can also be maps of sorts, revealing the stylized geography of the Dreaming. But most impressively, the paintings and carvings embrace a complex iconography, as rich as anything in Dürer, where circles and dots represent campsites and paths, where elaborate rituals are captured in a single freeze-frame. Last of all, the objects—sculptures, cave and bark paintings in the past, watercolors and acrylics today—may be elements of secret religious ceremonies only for the initiated.

One of the most remarkable features of this symbol-laden art lies in its continuity. Like the hippest cutting-edge conceptualism, much traditional aboriginal artwork is only temporary: sand or body paintings, objects that are destroyed during rites, toas (sculptured sticks) left as markers to weather and rot. Yet the Dreamings and their motifs, passed on from generation to generation, are as eternal as Platonic ideas or Jungian archetypes. So it is that schools of aboriginal artists who work with up-to-date materials flourish, though their canvases employ the same images as those used by long-dead ancestors. In part this persistence of vision is maintained through collective enterprise, with clan administrators distributing paints while advisers make sure that the artist remains faithful to the Dreaming.

Still, many contemporary aboriginal artists have been accused of demeaning the sacred, of transforming their culture into a commodity. In a sense, this must be true, for one can hardly expect a people living in the modern age to maintain the purity of the isolated millennia gone by. What would seem to matter is that for today's aboriginal painters the Dreamings, reverence for the land, and faithfulness to tradition help them create a vital, even avant-garde art. And to that art, both past and present, *Dreamings* provides a pioneering and eye-opening introduction.

Michael Dirda
Writer and editor, *Washington Post Book World*

No Place But Here: A Teacher's Vocation in a Rural Community
Garret Keizer
Viking, $15.95

"I am not the first to note," writes Garret Keizer, "that there are two Vermonts: the Vermont of ski lodges, craft

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boutiques, and fine restaurants; and the Vermont of rusted trailers, failing farms, and the endless cough."

In 1979, Keizer, then in his mid-20s, moved from New Jersey to Vermont number two. There, in the rural "Northeast Kingdom" of the state, he took the job he still holds as English teacher at Lake Region Union High School. In *No Place But Here*, his first book, the author amply demonstrates that there is more to Vermont than meets the eye of the casual tourist. At the same time, in 15 pithy chapter essays, Keizer serves notice that there is still elbow room amid the orthodoxies of his profession for the occasional iconoclast.

Books by or about fire-breathing teachers are not new, of course. What's fresh and even exhilarating about Keizer's book is its locale—an uncelebrated, backwater corner of New England—and his commitment to this place, to altering the lives of his students. On subjects ranging from student courtesy to teenage sex, Keizer opens up his classroom and his commitment with wry wit and rare zeal.

Shortly after his arrival, the author discovered that the ironically named Northeast Kingdom is, for his students, the kind of no-future, no-jobs American place that inspires the phrase "anywhere but here." Isolated and unexposed (except through television) to the outside world, kids entering his classes too often lack confidence in themselves and in their culture. "How come," one of the pupils asks Keizer, "on television, when there's somebody from Vermont, they always make him look dumb?"

Keizer's basic antidote to this collective inferiority complex is a blend of tough-mindedness and tenderness. "Puberty is beautiful; adolescence can be as cheap and trashy as the interests that prey upon it." Teenagers, he insists, "do not want to be adolescents. They want to be young women and men." Acting ambitiously on that notion, Keizer has the ninth-grade sons and daughters of farmers and mill workers reading *Oresteia*, the *Odyssey*, *Macbeth*, *The Return of the Native*. He expects great can-do effort—and, judging from the numerous examples of intellectual growth among his students, often gets it.

At the same time, Keizer keeps his finger on the pulse of what his students are experiencing outside the classroom.

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Without overdramatizing, he shows us the backdrop of unemployed parents, failed farms, teenage pregnancy, sexual abuse. "A teacher," he writes, "has been set apart from young people by age and by profession, and yet is in full view of them, and thus able to witness their struggles and admire their graces with an appreciation that peers and even parents may lack."

"If you want to get in trouble in a school," reads one of his many aphorisms, "take your job seriously." His students keep copious journals, work late into the night on a newspaper, read biographies of women as well as of men, do grammar lessons "where the antecedent of the pronoun 'she' is doctor, lawyer, or Indian chief."

Lest such classroom feats sound self-congratulatory, this teacher-author is, throughout, very much the self-critic. Sometimes his perspective is bitingly humorous: "One redeeming fact about being a high school teacher is that you are too busy to take your own abstract thinking very seriously, and too lowly regarded for anyone else to."

Keizer occasionally takes bitter, sweeping pokes at easy targets. Here the sympathy he has for a sexually abused student runs dry for whole groups of faceless professionals beyond the classroom: "The legislature passes a tougher child-support law and adjourns. The lawyers pull out the law's teeth and run for the legislature. The sociology professors discuss changing trends in the family and order another salad. But every day the girl with scalded feet gets out of bed and comes to school and sits two yards from my desk, burdened, twisted, hoisted and let fall by a score of halfhearted commitments. . . ."

Nonetheless, *No Place But Here* is a seasoned, razor-sharp testament to the complexity and fulfillment of a beleaguered yet essential vocation. Garret Keizer can do the truly remarkable: he can make a reader yearn to go back to high school.

Frank Levering
Virginia writer and orchardist

Januarius MacGahan: The Life and Campaigns of an American War Correspondent
Dale L. Walker
Ohio University Press, $29.95

Januarius MacGahan (1844-78) was an Ohio-born journalist who spent much of his brief life and virtually all of his

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vigorous career as a "war reporter in Europe and Central Asia," and who remains almost unknown in his native country. There's a hint of Stephen Crane in his precocious mastery of newsman's rhetoric, and something of the radical John Reed (author of *Ten Days That Shook the World*) in his sturdy embrace of challenge and danger wherever these beckoned.

MacGahan wrote at a time when "foreign correspondents and their newspapers exerted an unparalleled power over public thought." The most dramatic proof of this adorns his tomb in New Lexington, Ohio. The inscription reads, somewhat grandiosely:

MACGAHAN
LIBERATOR OF BULGARIA

This encomium results from MacGahan's assignment—in 1876, for the London *Daily News*—to report on the Bulgarian uprising against that country's Turkish oppressors. He discovered that previous accounts of the Turks' savagery toward civilians, generally believed to be exaggerated, had instead been understated. He excoriated British Prime Minister Disraeli's do-nothing policy (presumably because of Turkey's strategic importance to Britain). His battlefield dispatches, which created an international sensation, "transmuted from angry disclosure to Hyde Park peroration to sad prognostication to Russophilic warmongering." Indeed, MacGahan is credited—probably correctly—with helping to start the Russo-Turkish War of 1877.

Having sailed for Europe in 1868 (he'd planned to "study either languages or the law"), MacGahan kept finding himself in picturesque and volatile places (Brussels and Germany during the Franco-Prussian War, Paris at the time of the Commune). Early in 1871, he began writing of his associations and experiences for the newly prominent New York *Herald*. He covered the Carlist War in Spain and celebrated the exploits of the "engaging young Bourbon prince," Don Carlos. He had been assigned to "observe" Czar Alexander II and entourage during their 1871 Yalta vacation—and there met the woman (Varvara Elaguine) who became his wife.

Ever on the move, MacGahan observed firsthand the Russian Army's invasion of the walled city of Khiva in Turkestan (Walker calls this "one of the greatest adventures in the history of foreign correspondence"). He kept a vividly revealing daily diary during his participation in an 1875 voyage to the Arctic in search of logs and records of Sir John Franklin's lost expedition.

In the end, MacGahan paid dearly for his strenuous globe-hopping; the "long campaign in Bulgaria had devastated his health and energy" and he died of typhus three days before his 34th birthday.

Januarius MacGahan was a "vehemently partisan" journalist whose copy was more often argumentative and impassioned than objective. Still, the generous quotations from his writings given in the biography hold up wonderfully well. His brutal accounts of Turkish atrocities committed against the Bulgarian populace, and his memorable recounting of the Russo-Turkish War's climactic siege of Plevna, are models of descriptive clarity and narrative power.

In a different way, his letters to his beloved Barbara (her name anglicized

from Varvara), from whom he was often necessarily separated, are equally impressive. They constitute a charming, if fragmentary and painful, love story.

The telling of this irresistible tale gains double impact from Dale Walker's own considerable writing skills. He challenges himself to compete, not only with MacGahan's muscular style, but with the lucid prose of Barbara MacGahan (whose memoirs and letters are extensively quoted), herself a talented writer and translator. (For a time after her husband's death, she was the New York *Herald*'s St. Petersburg correspondent.)

Walker matches them both. His summaries of MacGahan's foreign ventures are masterly condensations. He contributes economical and precise biographical sketches of such personages in MacGahan's drama as the New York *Herald*'s Hearst-like editor, James Gordon Bennett jr.; the great Scottish correspondent Archibald Forbes (MacGahan's friend and contemporary); and the Russian general Michael Skobelev, a scholar-adventurer who became a devoted friend. Throughout, Walker frankly points out MacGahan's more-than-occasional sententiousness and shadings of truth, without ever compromising his movingly created impression of the great journalist's essential high intelligence and integrity.

Dale Walker has done Januarius MacGahan all the honor that has long been due him. It's a further bonus that his book is handsomely designed, and lavishly illustrated with period photographs, maps and drawings. I cannot imagine a better one on its subject.

Bruce Allen
Maine critic

Tocqueville
André Jardin
Translated by Lydia Davis
with Robert Hemenway
Farrar, Straus & Giroux, $30

Alexis de Tocqueville's *Democracy in America* won immediate popular and critical acclaim when it first appeared in 1835. Quickly translated into English and German, it catapulted its author into the public eye as an astute social critic. The book insured Tocqueville's visibility in French political life and his enduring fame even now, more than 150 years later.

André Jardin, who serves as general editor of Tocqueville's collected works in France, has written a thorough and authoritative account of Tocqueville's life and times, and if it lacks the passion of Tocqueville's own writing, still it captures the intensity of the worlds in which he lived.

There were two distinct worlds: the decaying aristocracy of early 19th-century France; the impetuous, youthful democracy of the American republic. Tocqueville, who saw democracy as the inevitable political wave of the future, sought to translate that culture for the edification of his sometimes bewildered compatriots.

Tocqueville seems an unlikely candidate to serve as prophet of liberty, equality and fraternity. He was born into a staunchly royalist family; his parents came close to execution during the Reign of Terror. Yet he did not share their ardent attachment to the Bourbons (but admitted to a "vestige of hereditary affection"), and his trip abroad, taken with his friend Gustave de Beau-

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mont in 1831, was intended as a respite while French politics settled down from the turmoil that overthrew Charles X.

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The trip was publicized as an examination of the American penal system, but from the first, the two young men (both in their mid-20s) planned a book of larger scope and interest. "Wouldn't it be good," Beaumont wrote home from shipboard, "to have a book that gives an accurate notion of the American people, that paints a broad portrait of their history, boldly outlines their character, analyzes their social state, and corrects the many mistaken opinions on this subject?"

Jardin is helpful in tracing Tocqueville's journey through America, and in locating the sources of his impressions about the culture he found so buoyant and intriguing. He spent, for example, little time in the South, where social stratification and landed gentry did not support some of his conclusions about equality. The Northern cities and New England villages served his purposes much better.

The audience for *Democracy in America* was, of course, Tocqueville's own compatriots. Teetering between monarchy and republic, France, he believed, needed to understand the consequences of the democratic life and its implications for personal behavior. Tocqueville himself was intensely interested in freedom, and fascinated by the possibilities of liberty and democracy. But he was not blind to the perils of a government by and for the people. In America, he saw, freedom led to individualism, isolationism and potential tyranny of the masses. He saw that in America, where one's private life was "so active and agitated, so full of desires and labor," people had little time to be involved in politics. Relinquishing this responsibility, he thought, might well lead to a new despotism.

Tocqueville spent his entire life in political service, one way or another, and it is this public life that Jardin explores here. One chapter alone is devoted to the private man, and this is made up largely of long quotations from other sources. Nevertheless, a personality emerges: that of a small, slight, wry

man, intense and anxious, irritable and moody, often insecure and overly sensitive to criticism. He had the reputation of brilliance, but he was a difficult man and not universally liked.

By the time he died in 1859, Tocqueville had seen his country—and the world—transformed. Domestic revolutions, particularly in 1848, had unalterably changed French politics and confirmed Tocqueville's view of the movement toward democratic rule. Like many of his contemporaries, he was both exhilarated by and suspicious of these changes, and his celebration of freedom, as Jardin tells us, was tempered with a nostalgia for the ordered, circumscribed society of his youth. *Tocqueville* gives us a man who straddled the old and the new, who served his contemporaries and his heirs by helping them to understand the complexities of the modern world.

Linda Simon
Teacher of expository writing,
Harvard University

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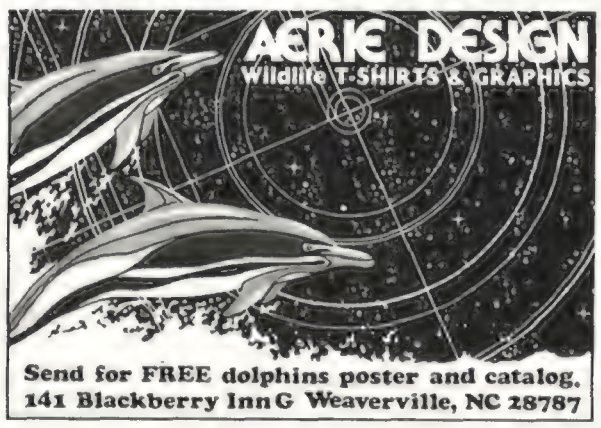

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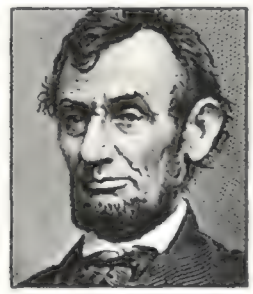

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Musical Weekend

Highlights of the 17th Musical Weekend, April 28-30, will include the Smithsonian Chamber Orchestra performing Beethoven on authentic period instruments; dinners at the National Portrait Gallery and the Museum of Natural History; luncheon at George Washington's farm; and tea and music at the Chinese Embassy. For further information, write: Musical Weekend, Room 4124 NMAH, Smithsonian Institution, Washington, D.C. 20560.

Washington Craft Show

The seventh annual Washington Craft Show, sponsored by the Women's Committee of the Smithsonian Associates, will be held April 20-23, in the Departmental Auditorium, 1301 Constitution Avenue N.W., across the street from the National Museum of American History. One hundred artists will exhibit and sell work in a variety of media. There will be an admission charge.

In conjunction with the Craft Show, the James Renwick Alliance will offer a special crafts weekend, with tours and lectures, on April 22 and 23. For details, call (301) 229-0928.

Leaf-patterned handcrafted vase is by Craft Show potter Mary Lou Deal.

Special March exhibits and events

National Portrait Gallery
The First Federal Congress (March 2-July 23) See *Highlights continued* on page 196.

National Museum of Natural History
A Celebration of Flowers: Two Centuries of Curtis Botanical Magazine (through April 30) An overview of botanical illustration.
Flora of Southern Africa (through April 30) Botanical plates by watercolorist Elise Bodley, in the Naturalist Center.
Crossroads of Continents: Cultures of Siberia and Alaska (through April 2) First jointly curated Soviet-North American exhibit ever: traditional cultures seen through 500 artifacts.
"Coyote": A Myth in the Making (through March 21) Retrospective look at works by Henry Fonseca.

Anacostia Museum
Inspiration: 1961-1989 (through March 5) Sixty-two works by 34 members of the District of Columbia Art Association.

National Museum of African Art
Royal Benin Art Creations from court artisans, 15th through 19th centuries.
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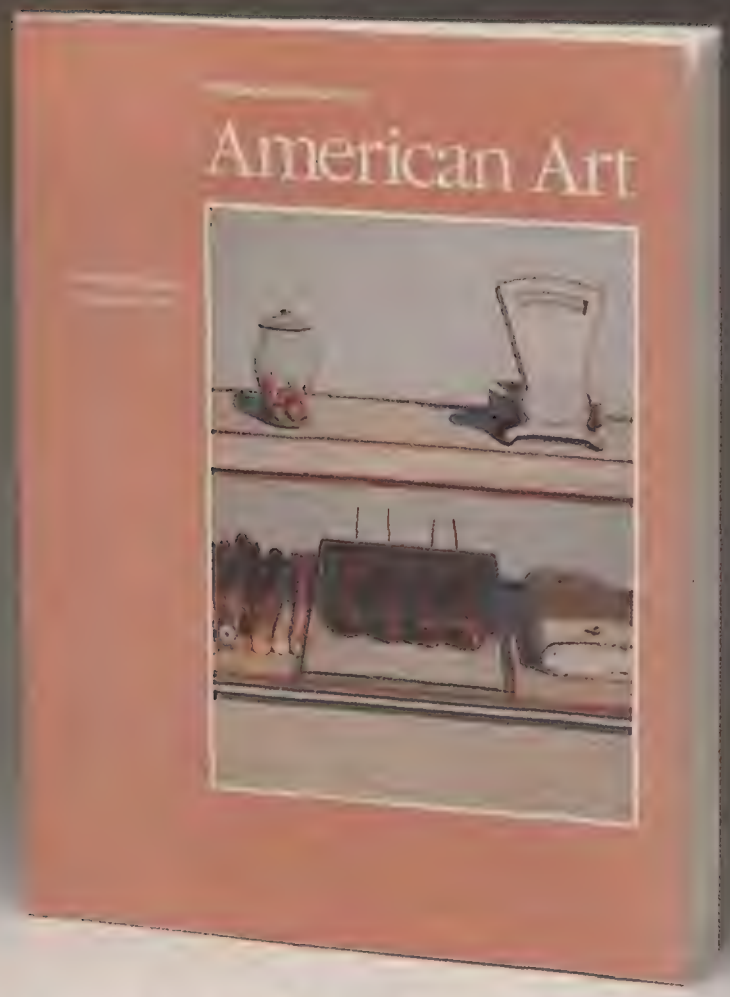

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Japanese Art: Recent Acquisitions (through September) A ceremonial palanquin and screens.

Hirshhorn Museum & Sculpture Garden
Thomas Eakins Photographs (March 21-June 26) Motion studies, portraits, Arcadian scenes in honor of the 150th anniversary of photography.
Recent Acquisitions, 1986-1989 (March 15-May 14) A selection of works by a wide range of contemporary artists including Jasper Johns and Milton Avery.
Directions: Mel Chin (through April 23) Sculptures, mixed-media installation.

National Museum of American History
American Women of the Etching Revival (March 15-May 31) Centennial exhibition featuring more than 70 works.
The American Presidency, 1789-1989 (through June) More than 400 objects and photographs.

National Air and Space Museum
Focus on Flight (through April) Forty photographs from the NASM contest.
Escape from Laos (March 23; 7:30 P.M.) Eugene Deatrick and Dieter Dengler on a daring rescue from a Cambodian prison camp during the Vietnam War.

Cooper-Hewitt Museum (New York)
L'Art de Vivre: Decorative Arts and Design in France, 1789-1989 (March 30-July 16) More than 400 objects created by French artisans, displayed in celebration of the bicentennial of the French Revolution.

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Catalogs available currently include:
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Big Jazz, Little Jazz (March 12; 7:30 P.M.) Doug Richards leads his Great American Music Ensemble in a tribute to Count Basie.
Tomorrow's Poets Today (March 5; 7:30 P.M.) Readings from four award-winning young poets.

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SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some March exhibits:
Ashland, Kentucky (March 18-April 23) *Portraits in Black: Outstanding Americans of Negro Origin from the Harmon Collection of the National Portrait Gallery*, Paramount Art Center Gallery.
Davenport, Iowa (March 11-May 28) *Victorian Gardens: A Horticultural Extravaganza*, Putnam Museum.
Denver, Colorado (March 18-June 4) *Vietnam Veterans Memorial: A National Experience*, Colorado Historical Society.
Gardner, Massachusetts (March 18-April 16) *Mexico As Seen by Her Children*, Children's Museum.
St. Petersburg, Florida (March 11-April 9) *Black Women: Achievement Against the Odds*, the St. Petersburg History Museum.

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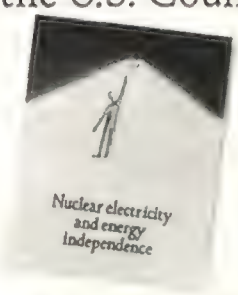

U.S. COUNCIL FOR ENERGY AWARENESS

Nuclear energy means more energy independence.

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The Smithsonian Traveler

THE LATEST WORD ON TOURS, EXPEDITIONS AND LEARNING ADVENTURES

A Special Invitation
Enjoy a Washington "Anytime" Weekend
Announcing a new discount available on Amtrak. Make your spring reservations today with VISA or MasterCard.

Domestic Study Tours

Sojourn in Tucson *April 1-8 or 15-22*: Folklore and natural history.

NEW **Renaissance Miami** *April 5-10*: Culture, art and architecture.

Spring Gardens *April 30-May 7*: From Washington, D.C. to Wilmington, Delaware.

NEW **Brooklyn with a Bang** *May 25-28 or September 14-17*: Architecture, art.

Sanibel-Captiva *May 28-June 3*: Flora and fauna on Florida's Gulf Coast.

NEW **Detroit Auto Barons** *June 8-11*: Visit estates of Ford, Fisher and Dodge.

Alaska Landscapes *June 20-July 2 or July 25-August 6*: Denali National Park and more.

Family Sampler *June 30-July 2*: Affordable weekend of Smithsonian fun for all ages.

Grand Canyon *June 30-July 9*: Raft down the magnificent Colorado.

Pueblo Indians *July 9-16*: Based in Santa Fe; concludes with an annual crafts fair.

Yosemite *July 13-22*: Easy, naturalist-led hikes through spectacular scenery.

Salmon River *July 18-26*: A raft trip that combines camping and a lodge visit.

Sojourn in Santa Fe *July 23-30*: Study historic and contemporary Hispanic culture.

Waterton-Glacier *July 24-August 4*: Hike the backcountry of Montana and Canada.

Lewis & Clark *July 29-August 5*: Horseback and camping on Idaho portion of 1805 trail.

Colorado Rockies *August 5-11*: Enjoy outdoor program at the Nature Place.

Railroading the Rockies *August 11-19*: By private car and narrow-gauge steam train.

Alaska Cruise *August 12-22*: Explore the Inside Passage aboard an expedition ship.

Black Hills & Crow Fair *August 16-25*: Includes Yellowstone and the Tetons.

Southwest Indians *August 24-September 3*: Hopi and Navajo from Phoenix to Santa Fe.

Foreign Study Tours

People's Republic of China Ten tours in 1989 for new and repeat travelers.

NEW **Atlantic Passage—Origins of Trade and Settlement in the Americas** *April 10-26*: Cruise from the Caribbean to West Africa.

NEW **Gardens of Northern Italy** *April 12-23*: Private gardens at Lake Maggiore, Verona.

Berlin *April 12-26*: Also features Dresden, Wittenberg, Weimar.

European Countryside Programs *May-September*: Relaxing sojourns in Hungary, England, Austria, France, Italy, Switzerland, West Germany or Wales.

NEW **Botswana-Zimbabwe** *May 9-26*: Includes Victoria Falls and Okavango Delta.

USSR-Golden Ring *May 20-June 3 or September 9-23*: Study ancient Russian culture.

Danube Voyage *May 23-June 9*: Art and history from Romania to West Germany.

Central Asia *May 27-June 8 or September 16-29*: From Leningrad, fly to Samarkand and Bukhara. Ends in Moscow.

Florence Seminar *May 27-June 11*: Classes and excursions based in a villa-hotel.

Greece *May 29-June 12*: History and art from Thessaloníki to Athens.

Odyssey of Flight *June 2-13*: Paris Air Show and 45th anniversary of D-Day.

Highlands of Scotland *June 2-18*: Culture and natural history. Residential program.

NEW **Turkey's Eastern Reaches** *June 7-24*: East from Ankara to the ancient Orient.

NEW **Cotswold Walks** *June 8-20*: A variety of walks through the English countryside.

Poland *June 9-25*: History and culture in Warsaw, Krakow and other cities.

NEW **Gardens of Brittany and Normandy** *June 10-23*: Includes Paris.

British Isles Voyage *June 16-July 3*: Remote hamlets and islands aboard the *Argonaut*.

Cave Art in France and Spain *June 19-July 4*: Basque coastlines, the Pyrenees, Dordogne.

Swiss Countryside Walks *June 21-July 6*: Moderate or challenging day hikes.

NEW **Canada-St. Lawrence** *June 22-July 3*: Montreal, Quebec, Toronto as well as a cruise on the *Canadian Empress*.

Walks in England's Lake District *June 29-July 12*: Natural and cultural history.

Scotland by Train *July 1-14*: Skye, Glasgow, Edinburgh, Inverness, the Highlands.

NEW **England for Families** *July 10-20*: Storybook London and the Cotswolds for families with children, grandchildren (ages 7-14).

Iceland *July 22-August 6*: Circle the island, study natural history, geology.

Baltic Passage *July 28-August 12*: Cruise to Denmark, Sweden, Finland, Leningrad.

NEW **Lena River-USSR** *July 28-August 16*: Exclusive cruise through Siberia.

NEW **Voyage to Sumatra and Java** *August 1-17*: Visit Singapore, Jakarta, Borobudur.

Voyage to Greenland and Hudson Bay *August 19-September 4*: Natural history, Inuit culture.

Smithsonian Seminars

Join fellow Associates who share your special interests at in-depth seminars with Smithsonian curators and guest experts.

Mohonk Mountain House
New Paltz, New York, *April 2-7*
Enjoy a fascinating look at Victorian art and architecture, and visit a sumptuous Hudson River valley home, or study the creation myths of the ancients—from Mesopotamia to Maya Mexico—at this unique, lakeside 19th-century resort.

Washington, D.C. *April 19-21*
Study Persian and Islamic art and see the Sackler Gallery's special exhibition "Persian Art and Culture in the Fifteenth Century." Or, learn about American coins and paper money as you study with curators from the Smithsonian's National Numismatic Collection and guest experts.

Write to Smithsonian National Associate Program, Washington, DC 20560 or call (202) 357-4700 for tour brochures, (202) 357-1350

Yellowstone National Park
Coming this summer
Explore the grandeur of America's first national park with Smithsonian scientists. Discover Yellowstone's beauty and learn about the area's cultural history and folklore.

Research Expeditions

Contribute your time, talent and financial resources to Smithsonian research. Work with curators at Washington, D.C. museums and archives, or at field sites around the country and the world.

Competition in the Forest
Front Royal, Virginia
March 11-25 and June 3-17
Track, observe and record the behavior of mammal and bird populations at the Smithsonian's Conservation and Research Center in the Blue Ridge Mountains of Virginia.

Dynamics of an Active Volcano
Costa Rica, *April 1-13*
Monitor the frequency, intensity and duration of Arenal Volcano's eruptive activity. Study volcanism's effects on vegetation.

Documenting Our Veterans Memorials
Washington, D.C. *May 24-June 7*
Join with Smithsonian photographers to record Memorial Day ceremonies at the Vietnam Veterans Memorial and other military monuments.

American Sculpture Inventory
Washington, D.C. *June 4-16*
Help establish the first nationwide survey of American sculpture as you conduct on-site inspections of traditional and contemporary works in the Washington, D.C. area.

British Enterprises in the New World
London, *June 18-30*
Conduct research on Caribbean colonization in London's libraries and museums for a new Smithsonian exhibition.

Creating Aerospace Curricula
Washington, D.C. *July 9-21*
Using galleries at the Air and Space Museum for inspiration, teachers (K-12) help education staff develop innovative pre- and post-visit aerospace activities for the hundreds of school groups who visit annually.

Air and Space Archival Treasures
Washington, D.C. *July 23-August 4*
Help archive historic documents and films at the Air and Space Museum and at the Paul E. Garber Facility.

for seminar and expedition brochures.

If you're as opposed to meetings as we are, drop us a line. We'd like to get to know you.

WE DON'T HAVE MEETING ROOMS in Jack Daniel's Hollow. But there are plenty of nearby places to hold discussions.

You see, making good whiskey doesn't call for meetings. What you need is ironfree water and choice grain; experienced Tennesseans to distill your whiskey; and vats of hard maple charcoal to mellow its taste. Happily, we don't have to leave our distillery for any of these good things. And with Cashion's Service Station just down the road, we can even hold a meeting now and then.

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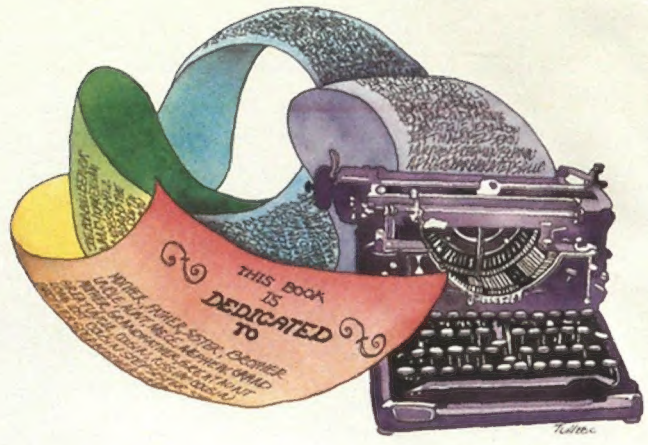
By Margaret Woolfolk

'To my husband, Donald, without whom . . .'



It's been a few years now since the publication of my first, last and, so far, only book. For some time after that historic event, I fretted that I would be just another one-book author, a scribbling flash in the pan. I soon realized, however, that I would have to pen and publish other volumes—if for no other reason than to carry the appropriate dedications that spouses, family and friends have come to expect from those who toil in literary fields.

It was probably the togaed statesman Aristides—and not a sales rep for an Athenian publishing house—who promoted the custom of dedications. According to my sources, Aristides declared that "temples are to be dedicated to the gods, and books to good men." Easy for him to say. Most of us don't have temples to dedicate, nor do we go in for appeasing the gods in a big way. We do, however, have a large circle of good men (and women) who are anxious to see their names inscribed for all eternity with printer's ink in the front of a book.

Dedicating one's work, of course, is a writer's opportunity to pay a debt, show appreciation for favors rendered or reward the person who put up with the most aggravation throughout the project —usually a spouse. Prolific Irving Stone has dedicated more than a dozen books to his wife, Jean, while Ernest Hemingway was able to dedicate four volumes to his wife—a different one each time. The possible embarrassment of having the dedication outlive one's marriage has caused more than a few writers to be somewhat vague when writing "To my wife, without whom . . ."

Love and gratitude, though, have not always been the writer's inspiration when dedicating a work. With dedicatory custom at its zenith during the 16th and 17th centuries, authors operated on a very basic principle (one not entirely unknown today, either), Greed. Simply put, writers shamelessly sold their honeyed words to the highest bidder for financial support and protection in an ever-shifting political climate. Notorious for his bad taste in dedicatory excess, John Dryden—for a price—indiscriminately heaped flattery upon men and women who were not only unworthy but whose bad character was widely known. Using another, but equally tacky, approach, Sir Balthasar Gerbier dedicated a small work in 1663 to 41 different people, from the Queen Mother on down to the "courteous reader."

Not everyone, of course, could humble himself in such an obvious fashion. A bold few turned away from modesty and convention to honor those most responsible for their work: themselves! English dramatist John Marston dedicated his *Scourge of Villainy* "To his most esteemed and beloved Selfe. . . ." George Wither dedicated a book in 1622 with the words "To himselfe G.W. wisheth all happinesse." The poet then went on to give seven reasons why he should dedicate the book to himself in preference to a patron. You just know that those two dedications are among the sincerest ever written.

Not surprisingly, it was during this period that a cottage industry of con men traveled the English countryside selling fraudulent dedications. Catering to the vanities of the nobility, these entrepreneurs went moat to moat with samples of spurious books into which they slipped a new dedication at each stop. Once paid, of course, the tricksters moved on to the next district, drawbridge and victim.

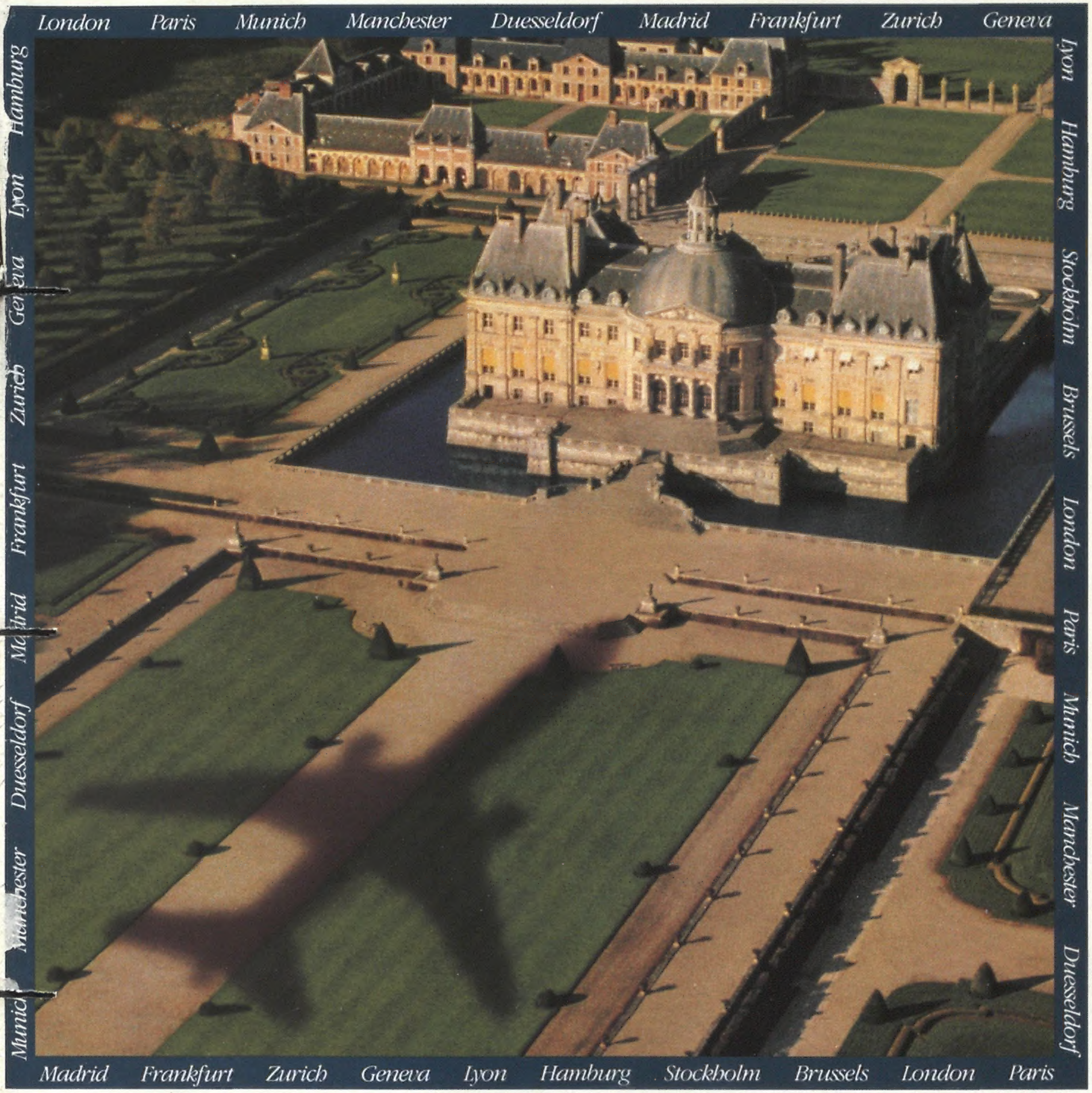
One of the all-time great writers of dedications was the acerbic 18th-century philosopher and wordsmith Dr. Samuel Johnson, who once boasted that he had dedicated "to the Royal Family 'all round.'" So considerable, in fact, was Johnson's reputation for penning good dedications that he frequently picked up extra income by writing them for others to use in their books. When his own patron, Lord Chesterfield, came through with a disappointingly small offer of support for Johnson's famous dictionary, he scathingly responded by asking: "Is not a patron, my lord, one who looks with unconcern on a man struggling for life in the water, and when he has reached ground, encumbers him with help?"

Now that temples, miffed gods and rich patrons are no longer a consideration, writers are free to write dedications that are as whimsical, original, lyrical or humorous as the books themselves. Written last and read first, dedications have been made to pets, editors, causes, food and even the "companion of my idle hours . . . my pipe." In 1851, Herman Melville, proclaiming admiration for the genius of his fellow scrivener, dedicated *Moby Dick* to Nathaniel Hawthorne; Hawthorne never returned the compliment, however. Art Buchwald once dedicated a book to his "expense account without whose generosity, understanding and padding," etc. Robert Louis Stevenson, Louisa May Alcott, Ogden Nash and William Makepeace Thackeray each gave their physicians a literary tip of the hat with warmly expressed dedications. P. G. Wodehouse, using parental license, dedicated *The Heart of a Goof* to his daughter, "without whose never-failing sympathy and encouragement this book would have been finished in half the time."

All of this, of course, has inspired me to spend a great deal of time thinking about the dedication of my next book. While it's not as poetic or fully developed as I'd like, it has possibilities:

"To my husband, Donald, without whom . . ."

EUROPE. FROM AN AMERICAN POINT OF VIEW.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